

NASA SP-5021 (16)

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# **INDEX TO NASA TECH BRIEFS 1975**

- Abstracts
- Subject Index
- Author Index
- Center Number/B Number Cross Reference

# Introduction

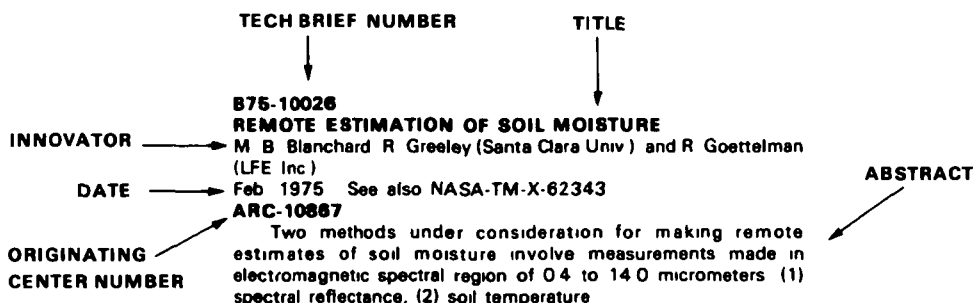
Tech Briefs are short announcements of new technology derived from the research and development activities of the National Aeronautics and Space Administration. These briefs emphasize information considered likely to be transferrable across industrial, regional, or disciplinary lines and are issued to encourage commercial application.

This *Index to NASA Tech Briefs* contains abstracts and four indexes—subject, personal author, originating Center, and Tech Brief number—for 1975 Tech Briefs.

## Abstract Section

The abstract section is divided into nine categories: Electronics/Electrical, Electronic/Electrical Systems, Physical Sciences, Materials/Chemistry, Life Sciences, Mechanics, Machinery, Equipment, and Tools, Fabrication Technology, and Computer Programs. Within each category, abstracts are arranged sequentially by Tech Brief number.

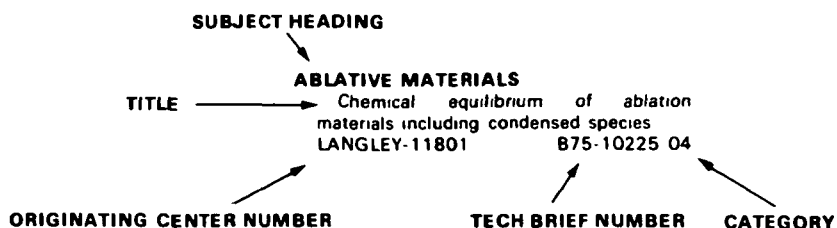
A typical abstract entry has these elements:



The originating Center number in each entry includes an alphabetical prefix that identifies the NASA Center where the Tech Brief originated. A list of prefixes and the corresponding Center names are given on page iii.

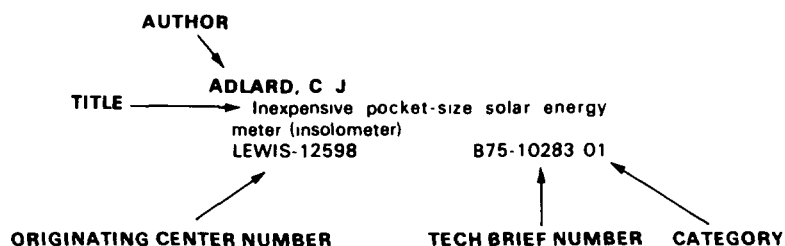
## Indexes

Four indexes are provided. The first is a subject index, arranged alphabetically by subject heading. Each entry in the subject index includes a Tech Brief number and a category number to aid the user in locating pertinent entries in the abstract section.

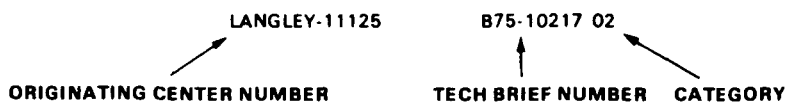


The January 1976 edition of the *NASA Thesaurus* (NASA SP-7050) is used as the authority for the indexing vocabulary that appears in the subject index. The *NASA Thesaurus* should be consulted in examining the current indexing vocabulary, including associated cross-reference structure. Only the subject terms that have been selected to describe the documents abstracted in this issue appear in the subject index. Copies of the *NASA Thesaurus* may be obtained from the National Technical Information Service or the U S Government Printing Office at \$23.50 for the two-volume set.

The second index is a personal author index. Entries in this index are arranged alphabetically by author's name. Tech Brief and category numbers are supplied to help the user find the appropriate entries in the abstract section.



The third index relates each originating Center number to the corresponding Tech Brief number and category. Entries in this index are arranged in alphanumeric order by Center number.



The fourth index relates each Tech Brief number to its originating Center number. Entries are arranged in ascending Tech Brief number order.



## Originating Center Prefixes

ARC	Ames Research Center
GSFC	Goddard Space Flight Center
HQ	NASA Headquarters
KSC	Kennedy Space Center
LANGLEY	Langley Research Center
LEWIS	Lewis Research Center
M-FS	Marshall Space Flight Center
MSC	Johnson Space Center (formerly Manned Spacecraft Center)
NPO	Jet Propulsion Laboratory/NASA Pasadena Office

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# Index to NASA Tech Briefs

February 1976

## Abstract Section

### 01 ELECTRONICS/ELECTRICAL

**B75-10014**

#### **ISOMETRIC SCAN METHOD FOR ULTRASONIC EVALUATION OF COMPOSITE PANELS**

A Vary and R L Sorg

Apr 1975

**LEWIS-12437**

I-scan form of data presentation provides more direct information on nature and severity of flaws present in test specimen and is more easily interpreted by inspector than conventional C-scans currently used. It also offers potential savings in inspection time and cost.

**B75-10025**

#### **TRIELECTRODE CAPACITIVE PRESSURE TRANSDUCER**

G W Coon

Feb 1975

**ARC-10711**

Capacitive transducer eliminates adverse effects of temperature and humidity. It is especially suited for measuring pressure changes in high-temperature environment. Transducer basically is three-electrode device.

**B75-10031**

#### **VARACTOR DIODE ASSEMBLY WITH LOW PARASITIC REACTANCES**

L E Dickens (Westinghouse Elec Corp)

Apr 1975

**GSFC-11617**

Development of varactor diode assembly overcomes parasitic reactances of conventional varactor packages. In specially constructed assembly very high idler-frequency to signal-frequency ratios are used to obtain low-noise operation over maximum bandwidth.

**B75-10036**

#### **INTERFACE CONTROL SCHEME FOR COMPUTER HIGH-SPEED INTERFACE UNIT**

B K Ballard (RCA)

Apr 1975

**M-FS-23083**

Control scheme is general and performs for multiplexed and dedicated channels as well as for data-bus interfaces. Control comprises two 64-pin dual in-line packages, each of which holds custom large-scale integrated array built with silicon-on-sapphire complementary metal-oxide semiconductor technology.

**B75-10039**

#### **IMPROVED PRINTED-WIRING BOARDS FOR HIGH-RELIABILITY CIRCUITS**

W J Patterson

Apr 1975

**M-FS-23147**

Experimental board includes three layers of special tridirectionally woven fabric. Alumina particles play major role in reducing coefficient of expansion. They also serve as heat sink for heat-generating components.

**B75-10049**

#### **SHOCK AND VIBRATION ISOLATION MOUNT FOR SMALL ELECTRONIC COMPONENTS**

F R Dillon (Martin Marietta Corp) and C R Mayne

Apr 1975

**NPO-13253**

Mount includes metallic cup and support ring placed in mold fixture. Viscoelastic material is injected between these parts by means of large hypodermic needle. Circular projections on cup and ring extend into material and are kept in place without dependence on quality of adhesion between material and metal.

**B75-10069**

#### **HIGH-TEMPERATURE CAPACITIVE STRAIN MEASUREMENT SYSTEM**

J E Wilson and L R Egger (Boeing Co)

May 1975

**FRC-10053**

Capacitive strain gage and signal conditioning system measures stress-induced strain and cancels thermal expansion strain at temperatures to 1500 F (815 C). Gage does not significantly restrain or reinforce specimen.

**B75-10070**

#### **FOURIER WAVEFORM ANALYZER**

F J Sutton

May 1975

**GSFC-11747**

Real-time Fourier analysis is provided by bucket brigade charge-transfer shift register. Device is small, inexpensive integrated circuit which does analog-to-digital-to-analog conversion, data processing, and time delay.

**B75-10071**

#### **HEATER IMPROVES COLD-TEMPERATURE CAPACITY OF SILVER-CADMIUM BATTERIES**

W H Webster Jr and P T Jackson

May 1975

**GSFC-11913**

Eight heaters are included in 14-cell package to provide 14-Vdc. Each heater is 11-ohm self-adhesive strip placed across broad face of each pair of cells. They are installed before cells are wired. Heaters are in series and are connected through pair of redundant thermostats.

**B75-10088**

#### **ONE-DIMENSIONAL MULTIMODE AND MULTISTATE OSCILLATOR: A CONCEPT**

M H Aumann (Wisconsin Univ)

Jun 1975

## 01 ELECTRONICS/ELECTRICAL

### HQ-10851

Device's voltage amplitude distribution is similar to that of standing waves on transmission line. It can be used for fast efficient information encoding/decoding and memory. Device operates in response to brief tone burst setting up standing-wave mode of oscillation which is unique for each possible burst frequency.

### B75-10091

#### DUAL-BAND RIDGED WAVEGUIDE

M J Franke

Jun 1975

### LANGLEY-11781

Waveguide-in-waveguide technique involves routing two waveguides through same passageway. Smaller waveguide can be soft or silver soldered inside X-band waveguide to form single ridge guide and to propagate frequencies at C-band.

### B75-10096

#### INTERACTIVE GRAPHICAL COMPUTER-AIDED DESIGN SYSTEM

M T Edge

Jun 1975

### M-FS-23157

System is used for design layout and modification of large-scale-integrated (LSI) metal-oxide semiconductor (MOS) arrays. System is structured around small computer which provides real-time support for graphics storage display unit with keyboard, slave display unit, hard copy unit, and graphics tablet for designer/computer interface.

### B75-10101

#### HIGH-PERFORMANCE SCHOTTKY DIODES ENDURE HIGH TEMPERATURES

E L Dickens (Westinghouse Elec Corp) G F Trageser (Westinghouse Elec Corp) and B H Kim (Westinghouse Elec Corp)

Jun 1975

### M-FS-23184

Fabrication process and aluminum/GaAs (gallium arsenide) coupling are used to produce Schottky diodes that have high cutoff frequencies and can withstand operating temperatures in excess of 500 C.

### B75-10102

#### INTEGRATED-CIRCUIT BALANCED PARAMETRIC AMPLIFIER

E L Dickens (Westinghouse Elec Corp)

Jun 1975

### M-FS-23193

Amplifier fabricated on single dielectric substrate has pair of Schottky barrier varactor diodes mounted on single semiconductor chip. Circuit includes microstrip transmission line and slot line section to conduct signals. Main features of amplifier are reduced noise output and low production cost.

### B75-10109

#### FLUORESCENT COLOR CODING OF POWER RECEPTACLES

C C Oleson (Rockwell Intern Corp) and D A Vidana (Rockwell Intern Corp)

Jun 1975

### MSC-19504

Receptacles color coded according to power ratings can be easily located. Low-light visibility of fluorescent paint saves considerable time during repair or replacement. Technicians using flashlights have located and identified painted receptacles from as far away as 50 feet (15 meters).

### B75-10120

#### MICROELECTRONIC FABRICATION OF SUPERCONDUCTING DEVICES AND CIRCUITS

K R Kirschman E J Mercereau and A H Notarys

Jun 1975

### NPO-13419

It is expected that thin-film superconductors can be used as detectors or sources of infrared and microwave radiation as magnetometers as voltage standards, and for voltage and

current measurements, for electronic signal processing, and in digital circuitry.

### B75-10171

#### SYSTEM FOR SIMULTANEOUS, BIDIRECTIONAL DATA TRANSMISSION

C C Schmidt (Lockheed Electronics Co)

Aug 1975

### MSC-14810

Single inexpensive system uses two identical circuits for simultaneous bidirectional data transmission. Frequency response with currently available amplifiers is from dc to over 70 kHz.

### B75-10195

#### STRIPE-LINE COIL FOR MAGNETIC-FIELD GENERATION IN BUBBLE MEMORY DEVICES

T T Chen (Rockwell Intern Corp) and E J Ypma (Rockwell Intern Corp)

Sep 1975

### LANGLEY-11705

Coil etched from conductive film has better field uniformity than wire-wound coils and less coil loss at high-frequency operation.

### B75-10196

#### LOW-LOSS STRIPE-LINE COIL FOR MAGNETIC BUBBLE MEMORY

T T Chen (Rockwell Intern Corp) and L C Zachry (Rockwell Intern Corp)

Sep 1975 See also B75-10195

### LANGLEY-11707

Stripe-line pattern is etched on both sides of double-sided film. Since conductor thickness is only half that of single-sided film, problems in wrapping and etching are greatly reduced.

### B75-10197

#### BUBBLE-DOMAIN CIRCUIT WAFER EVALUATION COIL SET

T T Chen (Rockwell Intern Corp) and L J Williams (Rockwell Intern Corp)

Sep 1975

### LANGLEY-11728

Coil structures have been designed to permit nondestructive testing of bubble wafers. Wafers can be electrically or optically inspected and operated from quasi-static frequency to maximum device operating frequency.

### B75-10213

#### MICROWAVE DIODE AMPLIFIERS WITH LOW INTERMODULATION DISTORTION

W H Cooper (Westinghouse Elec Corp) M Cohn (Westinghouse Elec Corp) and C D Buck (Westinghouse Elec Corp)

Oct 1975

### GSFC-11668

Distortions can be greatly reduced in narrow-band applications by using the second harmonic. The ac behavior of simplified diode amplifier has negative resistance depending on slope of equivalent I-V curve.

### B75-10219

#### OPEN COIL STRUCTURE FOR BUBBLE-MEMORY-DEVICE PACKAGING

T T Chen (Rockwell Intern Corp) and E J Ypma (Rockwell Intern Corp)

Oct 1975

### LANGLEY-11704

Concept has several important advantages over close-wound system: memory and coil chips are separate and interchangeable; interconnections in coil level are eliminated by packing memory chip and electronics in single structure; and coil size can be adjusted to optimum value in terms of power dissipation and field uniformity.

### B75-10220

#### IMPROVED PHOTOVOLTAIC DEVICES, USING TRANSPARENT CONTACTS



H J Hovel (IBM) and J M Woodall (IBM)  
Oct 1975

**LANGLEY-11761**

Transparent conducting coating is applied to narrow pn junction surface to provide ohmic contact for majority carrier flow. Coating can be made thick to prevent series resistance problem.

**B75-10221**

**VARIABLE-GAP BIAS STRUCTURE FOR MAGNETIC BUBBLE MEMORY PACKAGE**

T T Chen (Rockwell Intern Corp)  
Oct 1975

**LANGLEY-11765**

Size and thickness of field adjusting plate can be varied. Memory chip specification is relaxed since chips in structure need not be matched in bias margin.

**B75-10222**

**A 1-1/2-LEVEL ON-CHIP-DECODING BUBBLE MEMORY CHIP DESIGN**

T T Chen (Rockwell Intern Corp)  
Oct 1975

**LANGLEY-11766**

Design includes multi-channel replicator which can reduce chip-writing requirement. Selective annihilating switch which can effectively annihilate bubbles with minimum delay and modified transfer switch which can be used as selective steering-type decoder.

**B75-10230**

**ELLIPSOMETER MEASUREMENTS OF EPITAXIAL GAAS LAYERS - A CONCEPT**

J D DeSmet (Alabama Univ)  
Oct 1975

**M-FS-23238**

Report discusses analysis involving Maxwell's equations formed in a 6-by-6 matrix. By applying boundary conditions at proper points in sample equation for propagation of light through anisotropic medium is reduced to eigenvalue problem resulting in 4-by-4 matrix.

**B75-10233**

**100-AMPERE-HOUR NICD BATTERY SYSTEM**

Innovator not given (Grumman Aerospace Co) Oct 1975 See also NASA-CR-140380 NASA-CR-140381 NASA-CR-141600

**MSC-14774**

Cells use potassium hydroxide electrolyte and are hermetically sealed in stainless steel casings. Each cell provides 1.56 volts and has a minimum operating life of 17 000 hours and a maximum of approximately 48 000 hours.

**B75-10255**

**START/STOP SWITCHES FOR TESTING DETONATION VELOCITY OF EXPLOSIVES**

P J Wise and E W Grimes  
Oct 1975

**KSC-10793**

Printed-circuit process produces ordnance-initiated start/stop switches. Method is faster and less costly than fabrication by hand and produces switches of uniform quality.

**B75-10260**

**SIMPLE TEMPERATURE SENSOR WITH DIRECT READOUT**

W A Love (Rockwell Intern Corp)  
Oct 1975

**LANGLEY-11818**

Sensor is easy to construct, requires only one operational amplifier and has very fast response. It provides direct readout of temperature on digital voltmeter.

**B75-10274**

**RESPONSE OF TANTALUM CAPACITORS TO FAST TRANSIENT OVERVOLTAGES**

A J Zill and D K Castle  
Oct 1975 See also NASA-TM-X-58152

**MSC-14822**

Report describes tests used to determine minimum time for capacitors to fail due to overvoltage and maximum amount of overvoltage that capacitors could sustain without permanent damage.

**B75-10277**

**HIGHLY STABLE ANALOG-TO-DIGITAL CONVERTER**

H C Lucas  
Oct 1975

**NPO-13385**

Device has been developed for use in pulse-height analyzer of gamma-ray telescope. Unit shows integral linearity of 0.05 percent and differential linearity of less than 2 percent.

**B75-10283**

**INEXPENSIVE POCKET-SIZE SOLAR ENERGY METER (INSOLOMETER)**

F A Forestieri, M T Klucher, J C Adlard and K R Shaltens  
Nov 1975

**LEWIS-12598**

Device directly measures amount of energy available in sunlight falling on the earth over range from 1 to 1250 watts per square meter. Insolometer is ideally suited to making on-site measurements of available solar energy.

**B75-10289**

**SOLAR POWER ROOF SHINGLE**

F A Forestieri, F A Ratajczak, and G L Sidorak  
Dec 1975

**LEWIS-12587**

Silicon solar cell module provides both all-weather protection and electrical power. Module consists of array of circular silicon solar cells bonded to fiberglass substrate roof shingle with fluorinated ethylene propylene encapsulant.

**B75-10304**

**MICROCIRCUIT TESTING AND FABRICATION, USING SCANNING ELECTRON MICROSCOPES**

P D Nicolas  
Dec 1975

**M-FS-23159**

Scanning electron microscopes are used to determine both user-induced damages and manufacturing defects subtle enough to be missed by conventional light microscopy. Method offers greater depth of field and increased working distances.

**B75-10306**

**TEMPERATURE-STABLE GUNN-DIODE OSCILLATOR**

E J Dengenford (Westinghouse Elec Corp), E L Dickens (Westinghouse Elec Corp), W D Maki, and A B Newman (Westinghouse Elec Corp)

Dec 1975

**M-FS-23242**

Oscillator consisting of Gunn diode embedded in coaxial circuit has excellent temperature stability and low fabrication costs as compared with automatic-frequency-control crystal oscillators.

**B75-10312**

**QUALITY CONTROL OF MICROELECTRONIC WIRE BONDS**

A R Thiel (Gen Dyn Corp) and D C Schmidt (Gen Dyn Corp)

Dec 1975

**M-FS-23327**

Report evaluates ultrasonic bonding of small-diameter aluminum wire joined to ceramic substrates metalized with thin-film and thick-film gold. Quick testing technique for nondestructive location of poor wire bonds is also presented.

**B75-10324**

**ACID/ALKALI BROMIDE SECONDARY BATTERY**

C England  
Dec 1975

**NPO-13237**

Secondary electrochemical battery has been developed which has high energy/weight density. Battery is rechargeable and works on reaction between hydrogen and bromine.

## 01 ELECTRONICS/ELECTRICAL

### **B75-10330 HIGHLY-EFFICIENT HORN/REFLECTOR ANTENNA**

A K Green (Microwave Res Corp)

Dec 1975

**NPO-13568**

Antenna has beam efficiency of 96 percent Configuration is compact and relatively inexpensive

### **B75-10337 TRIGGER CIRCUIT FORCES IMMEDIATE SYNCHRONIZATION OF FREE-RUNNING OSCILLATOR**

S Nagano

Dec 1975

**NPO-13646**

Device provides positive triggering for inverter synchronization in uninterruptible power supplies Integrated-circuit oscillator frequency may be higher lower, or the same as that of the synch pulse and is always synchronized by first clock pulse

## 02 ELECTRONIC/ELECTRICAL SYSTEMS

### **B75-10012 IN-SERVICE TURBINE WHEEL CRACK MONITOR**

P J Barranger

Apr 1975 See also NASA-TN-D-7483

**LEWIS-12422**

System can be utilized in flight or at flight line It monitors disk rim for surface cracks emanating from blade root interface System consists of eddy-current sensor mounted approximately 1 1/2 mm (1/16 in) away from face of disk and remotely located electrical capacitance-conductance bridge and signal analyzer

### **B75-10037 FILL-IN BINARY LOOP PULSE-TORQUE QUANTIZER**

C B Lory (Charles Stark Draper Lab Inc)

Apr 1975

**M-FS-23100**

Fill-in binary (FIB) loop provides constant heating of torque generator an advantage of binary current switching At the same time it avoids mode-related dead zone and data delay of binary an advantage of ternary quantization

### **B75-10046 MULTIBEAM-ANTENNA FEED SYSTEM TO ISOLATE ORTHOGONALLY POLARIZED BEAMS**

J E Ohlson and W F Williams

Apr 1975

**NPO-13140**

System is polarization tracker and comprises variable polarizer polarization control and receiver servo loop System simultaneously receives desired signal and undesired signal which are approximately orthogonal They can be either paired as left and right circular polarizations or as cross-linear polarizations

### **B75-10059 BUFFER CONTROL UNIT FOR COMPUTER COMMUNICATIONS**

A K Okinaka (Hawaii Univ)

Apr 1975

**ARC-10870**

Unit provides character echoing for keyboard display parity and syndrome generation (error detection) half or full data-packet generation automatic retransmission of packets and keyboard lock-up

### **B75-10068 A TEST AND MEASUREMENT TECHNIQUE FOR DETER-**

### **MINING POSSIBLE LIGHTNING-INDUCED VOLTAGES IN AIRCRAFT ELECTRICAL CIRCUITS**

J A Plumer (GE) and L C Walko (GE)

Jul 1975 See also NASA-CR-2348

**LEWIS-12109**

Transient analyzer consists of four 0.5 microfarads capacitors chargeable by self-contained solid state 50 KV dc power supply operating from standard 110 Vac line voltage Unit can circulate unidirectional current impulses of up to 500 amperes through aircraft at waveshapes similar to those of natural lightning strokes

### **B75-10073 AUTOMATED DATA ACQUISITION AND REDUCTION SYSTEM FOR TORSIONAL BRAID ANALYZER**

G L Carl A T Inge N J Johnston and S K Dalal (Wyle Labs Inc)

May 1975

**LANGLEY-11578**

Automated Data Acquisition and Reduction System (ADAR) evaluates damping coefficient and relative rigidity by storing four successive peaks of waveform and time period between two successive peaks Damping coefficient and relative rigidity are then calculated and plotted against temperature or time in real time

### **B75-10086 TECHNIQUES FOR DECODING SPEECH PHONEMES AND SOUNDS A CONCEPT**

D C Lokerson and H G Holby

Jun 1975

**GSFC-11898**

Techniques studied involve conversion of speech sounds into machine-compatible pulse trains (1) Voltage-level quantizer produces number of output pulses proportional to amplitude characteristics of vowel-type phoneme waveforms (2) Pulses produced by quantizer of first speech formants are compared with pulses produced by second formants

### **B75-10092 MINIATURE SONAR FISH TAG**

R W Lovelady and R L Ferguson

Jun 1975

**LANGLEY-11814**

Self-powered sonar device may be implanted in body of fish It transmits signal that can be detected with portable tracking gear or by automatic detection-and-tracking system Operating life of over 4000 hours may be expected Device itself may be used almost indefinitely

### **B75-10103 CENTRAL CONTROL ELEMENT EXPANDS COMPUTER CAPABILITY**

R A Easton (Hughes Aircraft Co)

Jun 1975

**M-FS-23216**

Redundant processing and multiprocessing modes can be obtained from one computer by using logic configuration Configuration serves as central control element which can automatically alternate between high-capacity multiprocessing mode and high-reliability redundant mode using dynamic mode switching in real time

### **B75-10107 HIGH-EFFICIENCY K-BAND TRACKING ANTENNA FEED**

R L Beavin (McDonnell Aircraft Co) and A I Simanyı (McDonnell Aircraft Co)

Jun 1975 See also NASA-CR-134193

**MSC-14717**

Antenna feed features high aperture efficiency of multimode near-field horn and develops tracking signals without conventional monopulse bridge Feed assembly is relatively simple and very compact However feed is sensitive to cross-polarized energy which couples into orthogonal error channel

### **B75-10108 HIGH-POWER AC/DC VARIABLE LOAD SIMULATOR**

K P Joncas (Avco Corp) S Birnbach (Avco Corp) L D Bruce (Avco Corp), and L Smith (Avco Corp)  
Jun 1975 See also B73-10305 NASA-CR-140331

**MSC-14788**

Design of medium-power dynamic electrical load simulator has been extended to permit simulation of ac as well as dc loads and to provide for operation at higher power levels Simulator is internally protected against reverse voltage overvoltage overcurrent and overload conditions

**B75-10114****QUASARS AS VERY-ACCURATE CLOCK SYNCHRONIZERS**

W J Hurd and R M Goldstein

Jun 1975

**NPO-13276**

Quasars can be employed to synchronize global data communications, geophysical measurements, and atomic clocks It is potentially two to three orders of magnitude better than presently-used Moon-bounce system Comparisons between quasar and clock pulses are used to develop correction or synchronization factors for station clocks

**B75-10122****TRANSMITTER SWITCH FOR HIGH-POWER MICROWAVE OUTPUT**

C P Wiggins and R K Leu

Jun 1975

**NPO-13439**

Combiner system can be used for combining output powers of two transmitters or for switching from one to the other This can be done when pair of transmitters operate on same frequency and carriers are phase coherent as by excitation from single exciter

**B75-10129****HIGH-SPEED DATA WORD MONITOR**

M N Wirth

Jun 1975

**ARC-10899**

Small portable self-contained device provides high-speed display of bit pattern or any selected portion of transmission can suppress filler patterns so that display is not updated and can freeze display so that specific event may be observed in detail

**B75-10136****WIND ENERGY UTILIZATION A BIBLIOGRAPHY**

Innovator not given (New Mexico Univ) Jul 1975

**LEWIS-12518**

Bibliography cites documents published to and including 1974 with abstracts and references and is indexed by topic author organization, title and keywords Topics include Wind Energy Potential and Economic Feasibility, Utilization Wind Power Plants and Generators Wind Machines Wind Data and Properties, Energy Storage and related topics

**B75-10150****SOLID STATE REMOTE POWER CONTROLLERS FOR 120 VDC POWER SYSTEMS**

G R Sundberg and D E Baker (Westinghouse Elec Corp)

Oct 1975 See also NASA-CR-134772

**LEWIS-12523**

Solid state remote power controllers can be applied to any dc power system up to 120 Vdc and distribute power up to 3.6 kW per hour Devices have demonstrated total electrical efficiencies of 98.5 percent to 99.0 percent at rated load currents

**B75-10152****LOW-COST, COMPACT, COOLED PHOTOMULTIPLIER ASSEMBLY FOR USE IN MAGNETIC FIELDS UP TO 1400 GAUSS**

R W Patch, R A Tashjian and T A Jentner

Sep 1975 See also NASA-TM-X-71635

**LEWIS-12445**

Use of vortex tube for cooling and concentric shielding have produced smaller and more compact unit than was previously

available Future uses of device could include installation in gas chromatographs and mass spectrometers Additional uses would include measurements and controls in magnetohydrodynamic power generators and fusion reactors

**B75-10153****DIGITAL TAPE DRIVE MONITOR**

R T McKenna

Aug 1975

**GSFC-11925**

Network checks skew and character spacing of digital tape drive systems automatically Tape drive is set up and calibrated to check any written tape when tape is read back It will indicate track errors or character spacing errors should they exceed specifications

**B75-10154****VOLTAGE MONITORING SYSTEM**

C L Canicatti

Aug 1975

**KSC-10736**

System serves as central station which can monitor voltage variations through transmission lines connected to equipment scattered in different locations Voltage-controlled oscillator is optional It is used in some systems to condition signal to make it compatible with certain types of oscillographs

**B75-10156****NONDESTRUCTIVE MEASUREMENT OF CAPILLARY TUBE INTERNAL DIAMETER**

W W Ho (Rockwell Intern Corp), A W Love (Rockwell Intern Corp), and M J VanMelle (Rockwell Intern Corp)

Aug 1975

**LANGLEY-11647**

Technique provides nondestructive method of making quick accurate determination by measuring electrical resistance of capillary tube when it is filled with electrolyte of known conductivity Apparatus consists of conductivity cell and equipment for measuring resistance and for monitoring and controlling temperature

**B75-10161****PAGE COMPOSER TO TRANSLATE BINARY ELECTRICAL DATA TO OPTICAL FORM**

G A Bailey and L S Cosentino (RCA)

Aug 1975

**M-FS-22589, M-FS-23173**

Composer converts binary data to optical form for storage as hologram Device consists of an array of deformable metal membranes controlled by MOSFETs Device is fast produces high contrast ratios does not degrade with extended use and can be addressed from diverse angles

**B75-10162****ZENER-REGULATED SOLAR ARRAY/BATTERY POWER SYSTEM**

J T Eliason (Sperry Rand Corp)

Aug 1975

**M-FS-23195**

Zener diode limits solar cell voltage used to charge battery System improves life and reliability of solar cells

**B75-10169****A HYBRID GENERAL-PURPOSE BIT SYNCHRONIZER**

J J Stiffler (Raytheon Co) and A H VanDoren (Raytheon Co)

Aug 1975 See also NASA-CR-115751

**MSC-14330**

Synchronizer is not affected by severe noise environments Device uses both analog and digital techniques in its tracking loop It accommodates any one of three signal formats Rapid acquisition sequences are used to minimize acquisition time

**B75-10175****FAST FOURIER TRANSFORMATION COMPUTER USING FAST COUNTERS**

S Zohar

## 02 ELECTRONIC/ELECTRICAL SYSTEMS

Aug 1975

### **NPO-13110**

Two designs have been developed for cost-effective fast transformation of data points in small batches (where N is equal to or less than 32). One design is applicable to N prime and one to all N.

### **B75-10180**

#### **NEW BROADBAND SQUARE-LAW DETECTOR**

M S Reid R A Gardner, and C T Stelzried

Aug 1975

### **NPO-13410**

Compact device has wide dynamic range accurate square-law response good thermal stability high-level dc output with immunity to ground-loop problems ability to insert known time constants for radiometric applications and fast response times compatible with computer systems

### **B75-10184**

#### **PROGRAMED ASYNCHRONOUS SERIAL DATA INTER-ROGATION IN A TWO-COMPUTER SYSTEM**

N A Schneberger (Honeywell Inc)

Sep 1975

### **GSFC-11778**

Technique permits redundant computers with one unit in control mode and one in MONITOR mode to interrogate the same serial data source. Its use for program-controlled serial data transfer results in extremely simple hardware and software mechanization.

### **B75-10191**

#### **HIGH-VOLTAGE STEPPING SUPPLY WITH FAST SETTLING TIME**

H Doong and M H Acuna

Sep 1975

### **GSFC-11844**

Waveform generator is used to derive low-voltage staircase waveform that feeds relatively long response time power supply. Power supply has high output voltage that is predetermined multiple of the input voltage.

### **B75-10192**

#### **VIDEO SWITCHER FOR COUPLING VIDEO CAMERAS TO SINGLE TV MONITOR**

I A Richter

Sep 1975

### **KSC-10782**

Device couples up to 60 TV cameras to single monitor. Video switching is provided by diode matrix arranged in a 60-by-1 configuration. Switcher can be operated manually or automatically.

### **B75-10204**

#### **MEASUREMENT OF TRAP DENSITY IN DIELECTRIC FILM**

J E Guisinger and J Maserjian

Sep 1975

### **NPO-13443**

Method uses basic circuit to examine quality and trap density of film used in insulated gate field effect transistors. Data are measured as function of performance and life expectancy.

### **B75-10205**

#### **REAL-TIME SPEECH ANALYZER**

J P Hong

Sep 1975

### **NPO-13465**

System uses phase-locked loops to give real-time information on speech spectrum by tracking the fundamental and its first 19 harmonics.

### **B75-10215**

#### **VARIABLE-BEAMWIDTH ANTENNA WITHOUT MOVING PARTS**

L F Deerkoski and R F Schmidt

Oct 1975 See also B74-10041 B74-10257

### **GSFC-11924**

Basic configuration consists of large parabolic dish reflector

smaller hyperboloidal subreflector, and two sets of monopulse feeds located in conjugate focal region on boresight axis of dish.

### **B75-10217**

#### **AUTOMATED STATISTICAL ANALYSIS PROGRAM (ASAP)**

S J Bavuso

Oct 1975

### **LANGLEY-11125**

Pattern recognition subprogram is used to produce table which indicates sections of input data. Program then uses data to write set of Kirchhoff equations algebraically solved by Gauss reduction method.

### **B75-10218**

#### **CONTINUOUS-PHASE FREQUENCY-SHIFT-KEYED GENERATOR**

M S Feryszka

Oct 1975

### **LANGLEY-11638**

Device combines features of crystal oscillator frequency stability and voltage-controlled oscillator phase continuity.

### **B75-10240**

#### **HIGH-ACCURACY PROGRAMABLE SQUARE-LAW DETECTOR SYSTEM**

M S Reid R A Gardner and C T Stelzried

Oct 1975 See also B75-10180

### **NPO-13525**

Programmable system introduces correction factor to compensate for detector deviation from square-law response. If detector output voltage is V the corrected output voltage is determined as  $V_{corrected} = aV^2$  where a is correction factor. Factor is determined and used automatically with digital computer techniques.

### **B75-10247**

#### **THREE-PHASE DC MOTOR DECODER**

P A Studer

Oct 1975

### **GSFC-11824**

Circuit minimizes components required to provide six properly timed drive signals from three equal-interval sensor inputs.

### **B75-10254**

#### **PORTABLE HEADSET MICROPHONE CHECKER**

J Davenport J A Foster and W R Langley

Oct 1975

### **KSC-10699**

Simple and reliable test system gives go/no-go indication of output level of headset microphones. Portable system has its own internal battery power supply and can be used in field or in laboratory with wide variety of headset types.

### **B75-10265**

#### **REAL-TIME VIDEO CORRELATOR**

P E Geise (Sperry Rand Corp) M Petcher (Sperry Rand Corp)

and D F Cornwell (Sperry Rand Corp)

Oct 1975

### **M-FS-23200**

Device provides two-dimensional correlation of video data. Operation is reliable accurate and predictable.

### **B75-10275**

#### **LASER-EXCITED FLUORESCENCE FOR MEASURING ATMOSPHERIC POLLUTION**

R T Menzies

Oct 1975

### **NPO-13231**

System measures amount of given pollutant at specific location. Infrared laser aimed at location has wavelength that will cause molecules of pollutant to fluoresce. Detector separates fluorescence from other radiation and measures its intensity to indicate concentration of pollutant.

### **B75-10281**

#### **LOW-NOISE K(U)-BAND RECEIVER INPUT SYSTEM**

## 03 PHYSICAL SCIENCES

R W Berwin P R Dachel and E R Weibe

Oct 1975

**NPO-13645**

Improved maser and superconducting magnet which operates in vacuum of closed-cycle helium refrigerator comprise a low-noise reliable field-operational receiver input system

**B75-10291**

**DELAY-LOCK-LOOP CODE-CORRELATION SYNCHRONIZER**

C T Pardoe (Johns Hopkins Univ)

Dec 1975

**GSFC-11868**

Temperature dependence and sensitivity to noise are greatly reduced in system designed to process biphase-level pulse-code-modulated signals

**B75-10296**

**MONITOR FOR CHECKING ELECTRIC-FIELD METERS**

L D Holley

Dec 1975

**KSC-10851**

Portable monitor can be used to check electric-field meters on location. Faulty communication line or faulty unit can be determined on the spot

**B75-10297**

**TIME-OF-ARRIVAL LIGHTNING ACTIVITY LOCATION SYSTEM**

C L Lennon

Dec 1975

**KSC-11006**

System fixes location of charge buildup in clouds. It provides range azimuth and elevation in real-time so that warning of charge buildup can be implemented

**B75-10316**

**SOLID-STATE MOTOR CONTROL AND MONITOR SYSTEM**

L G Monford, Jr

Dec 1975

**MSC-12721**

Compact solid-state system may be used for multifunction motor control. System can provide 12 control functions for under \$100

**B75-10323**

**MULTICHANNEL HIGH-SPEED CORRELATOR**

T O Anderson

Dec 1975

**NPO-13097**

Device is used in real-time signal processing system for detection of radar signals in noise

**B75-10325**

**SYNCHRONIZER FOR RANDOM BINARY DATA**

T O Anderson J K Holmes and W J Hurd

Dec 1975

**NPO-13286**

Simplified binary-data transition detector for synchronization of relatively noise-free signals can be used with radio or cable data-control links. It permits reception of binary data in absence of clock signal or self-clocking coder

**B75-10326**

**COMPUTER/COMPUTER INTERFACE**

T O Anderson

Dec 1975

**NPO-13428**

System synchronizes data transfer between two computers by generating data strobe pulses when computers are ready for data transfer. In addition interface filters noise by sampling

**B75-10001**

**A SUPERIOR PROCESS FOR FORMING TITANIUM HYDROGEN ISOTOPIC FILMS**

R Steinberg D L Alger and D W Cooper

Mar 1975

**LEWIS-12083**

Process forms stoichiometric continuous strongly bonded titanium hydrogen isotopic films. Films have thermal and electrical conductivities approximately the same as bulk pure titanium ten times greater than those of usual thin films

**B75-10004**

**PROPERTIES OF AIR AND COMBUSTION PRODUCTS OF FUEL WITH AIR**

D J Pofert and R Svehla

Mar 1975 See also NASA-TN-D-5452, NASA-TN-D-7488

**LEWIS-12402**

Thermodynamic and transport properties have been calculated for air the combustion products of natural gas and air and combustion products of ASTM-A-1 jet fuel and air. Properties calculated include ratio of specific heats molecular weight viscosity specific heat, thermal conductivity Prandtl number and enthalpy

**B75-10008**

**UNIFORM HIGH IRRADIANCE SOURCE**

A R Lunde (Boeing Co) A Fortini and D R Buchele

Apr 1975 See also NASA-CR-134523, NASA-SP-298

**LEWIS-12360**

New 50 Kw xenon short arc lamp mounted within elliptical collector provides irradiance levels up to  $4.4 \times 10^5$  to the 7th power watts/sq m with non-uniformity ratio of 3:30. Energy mixer or light pipe between lamp source and target improves non-uniformity to required ratio

**B75-10017**

**A METHOD FOR MEASURING COOLING AIR FLOW IN BASE COOLANT PASSAGES OF ROTATING TURBINE BLADES**

C H Liebert and F G Pollack

Apr 1975 See also NASA-TN-D-7697

**LEWIS-12433**

Method accurately determines actual coolant mass flow rate in cooling passages of rotating turbine blades. Total and static pressures are measured in blade base coolant passages. Mass flow rates are calculated from these measurements of pressure measured temperature and known area

**B75-10024**

**ELECTRICAL GAS HEATER WITH LARGE FLOW RANGE CAPABILITY**

B A Benson (Boeing Co) and A Fortini

May 1975 See also NASA-CR-134523

**LEWIS-12361**

Auxiliary heat transfer device in form of tightly-wound helical tube was incorporated into conventional heater design to provide hydrogen heater with turn-down ratio greater than 100. Device greatly increases low flow rate capacity of heater by providing maximum heat-transfer area for low mass flows

**B75-10026**

**REMOTE ESTIMATION OF SOIL MOISTURE**

M B Blanchard R Greeley (Santa Clara Univ) and R Goettelman (LFE Inc)

Feb 1975 See also NASA-TM-X-62343

**ARC-10867**

Two methods under consideration for making remote estimates of soil moisture involve measurements made in electromagnetic spectral region of 0.4 to 14.0 micrometers (1) spectral reflectance (2) soil temperature

### 03 PHYSICAL SCIENCES

#### B75-10028

##### STUDY OF FLUID FLOW BY CHARGED PARTICLES

M Deluca (Ohio State Univ) and H R Velkoff (USAA MRDL)  
Feb 1975

#### ARC-10925

Analytical and experimental effort explores possibility of using charged particles as diagnostic tool in study of fluid flows Test program involved right circular cylinder and airfoil located in large wind tunnel ions were injected into flow and resulting currents at surfaces were monitored

#### B75-10034

##### COAXIAL, SELF-ALIGNING OPTICAL SCANNING SYSTEM

D B Rhodes  
May 1975

#### LANGLEY-11711

System provides fast way to sequentially focus optical energy (light) at preselected points in space It transmits optical energy to point in space while at same time receiving any optical energy generated at that point and then moves on to next selected point and repeats this transmit-and-receive operation

#### B75-10035

##### TRANSMISSION OSCILLATOR ULTRASONIC SPECTROMETER (TOUS) A NEW RESEARCH INSTRUMENT

J S Heyman F D Stone, M S Conradi (Washington Univ) and J G Miller (Washington Univ)  
Apr 1975

#### LANGLEY-11735

TOUS is capable for measuring very small changes in acoustic attenuation and phase velocity Its high sensitivity to small changes in ultrasonic absorption results in part from operation under marginal conditions In spite of high sensitivity TOUS system is relatively simple inexpensive and compact

#### B75-10040

##### VIEWFINDER/TRACKING SYSTEM FOR SKYLAB

W L Casey (Martin Marietta Corp)  
Apr 1975 See also NASA-CR-133967 NASA-TM-X-69040

#### MSC-14407

Basic component of system is infrared spectrometer designed for manual target acquisition pointing and tracking and data-take initiation System incorporates three main subsystems which include (1) viewfinder telescope (2) control panel and electronics assembly and (3) IR-spectrometer case assembly

#### B75-10043

##### REFRACTING LENS SYSTEM FOR LOW-SCATTER STAR-TRACKER A CONCEPT

Innovator not given (Optics Res Laboratories) Apr 1975 See also NASA-CR-134224

#### MSC-14724

Low Scatter Lens Design/Development discusses studies of low-scatter lens system Two sections cover optical design and scattering analysis for model of lens system which rejects radiation Result of computations are shown on computer printouts attached to report

#### B75-10047

##### ACOUSTICALLY CONTROLLED INTEGRATED LASER FOR COMMUNICATIONS SYSTEMS

C Elachi  
Apr 1975  
NPO-13175

Acoustic wave creates fringes by producing periodic stresses in substrate and in film Laser carrier frequency is then changed by simply changing acoustical frequency When two acoustical sources are applied off beam axis, beam can be scanned at very rapid rates

#### B75-10048

##### AUTOMATICALLY-FOCUSING MICROSCOPE SYSTEM FOR LIVE TISSUE OBSERVATION

M N Mansour C P Chapman and H J Wayland  
Apr 1975  
NPO-13215

System includes focus-sensing arrangement which controls servo to keep microscope constantly focused on target Microscope objective is moved along optical axis System includes two video cameras that are used as transducers for sensing focus Incoming visual image is split by beam splitter so that one-half of information is fed to each camera

#### B75-10050

##### RESONANT CHAMBERS FOR SUSPENDING MATERIALS IN AIR

T G Wang, M W Saffren and D D Elleman  
Apr 1975

#### NPO-13263

Acoustical pressure of standing wave is used to suspend materials inside resonant chambers Material is driven to standing-wave antinodes where pressure is lowest Pressure at nodes is greatest which prevents suspended material from collecting there Material can be moved inside chambers by changing wave patterns

#### B75-10075

##### HANDBOOK OF NOISE RATINGS

K S Pearsons (Bolt Beranek and Newman, Inc) and R L Bennet (Bolt Beranek and Newman, Inc)  
May 1975 See also NASA-CR-2376

#### LANGLEY-11799

Handbook announced in Tech Brief is compendium of information describing multifarious noise methods now in use Reference material gives user better access to definitions application, and calculation procedures of current noise rating methods

#### B75-10080

##### DATA PROCESSING LARGE QUANTITIES OF MULTISPECTRAL INFORMATION

R E Haskell (Oakland Univ)  
May 1975

#### MSC-14472

Method is combination of digital and optical techniques Multispectral data is coded into binary matrix format and then encoded onto photographic film Film is holographically correlated with spectral signature to generate single-class classification map Number of maps are optically superimposed to produce full-color multiclass classification map

#### B75-10081

##### INFRARED TUNABLE LASER A CONCEPT

K W Billman  
May 1975

#### ARC-10463

Apparatus in which laser wavelengths of two dyes are mixed in intracavity nonlinear crystal provides intense source of coherent laser radiation which is tunable from visible through infrared wavelengths of electromagnetic spectrum

#### B75-10082

##### A NONDISPERSIVE INFRARED ANALYZER

J Dimeff  
May 1975 See also B72-10198 B74-10243  
ARC-10631

Apparatus retains all advantages of prior nondispersive infrared analysis systems and provides significantly more immunity to type of errors that may be introduced by geometric changes in analysis system Technique also permits construction of instruments of lower weight smaller volume and smaller power consumption

#### B75-10087

##### ANTIRESONANT RING INTERFEROMETER FOR LASER CAVITY DUMPING, MODE LOCKING, AND OTHER APPLICATIONS

A E Siegman (Stamford Univ)  
Jun 1975  
HQ-10844

Applications in lasers for antiresonant ring interferometer include coupled laser cavities variable laser-output coupling

intercavity harmonic-output coupling mode locking cavity dumping, and pulse code modulation

**B75-10090**

**HOLOGRAPHIC DIRECT-VISION SPECTROSCOPE**

J M Franke

Jun 1975

**LANGLEY-11750**

Spectroscopy incorporates two prisms combined with holographic grating as dispersing element This provides high dispersion with selective undeviated wavelength Prisms with different indices of refraction and/or angles for construction and reconstruction may be used Also different prisms for input and output may be used

**B75-10097**

**SUPERCONDUCTING QUANTUM-INTERFERENCE DEVICES**

P N Peters and L B Holdeman

Jun 1975

**M-FS-23163**

Published document discusses devices which are based on weak-link Josephson elements that join superconductors Links can take numerous forms and circuitry utilizing links can perform many varied functions with unprecedented sensitivity Theoretical review of Josephson's junctions include tunneling junctions point contact devices microbridges and proximity-effect devices

**B75-10098**

**LARGE-SCALE SOLAR THERMAL COLLECTOR CONCEPTS**

L W Brantley

Jun 1975

**M-FS-23167**

Thermal collector could be used ultimately to power steamplant to produce electricity Collector would consist of two major subsystems (1) series of segmented tracking mirrors with two axes of rotation and (2) absorber mounted on centrally located tower

**B75-10099**

**DICHROMATED-GELATIN HOLOGRAM PROCESS FOR IMPROVED OPTICAL QUALITY**

W C Stewart (RCA)

Jun 1975

**M-FS-23170**

Optical distortions are eliminated by use of wetting agency followed by sequential immersion in several alcohol-water baths of increasing alcohol concentration Dehydration proceeds uniformly over surface of gelatin Dried plate is free of optically-distorting thickness variations

**B75-10105**

**WIDE-FIELD BIREFRINGENT ELEMENTS**

A Miller (RCA)

Jun 1975

**MSC-12677**

Birefringent array consists of two plates with retardation properties nearly independent of direction of incident light over unlimited range of wavelengths Array can be used as birefringent color filter Optical properties of plates may also be changed electro-optically rather than thermally

**B75-10112**

**LASER SCANNED IMAGE SENSORS USING PHOTOCONDUCTORS WITH DEEP TRAPS**

J Maserjian

Jun 1975

**NPO-13131**

Photoconductor records image when holes and electrons are trapped inside it due to incident photons Image can be read out by exposing photoconductor to scanning laser beam Photons from scanning laser empty traps generating photocurrent Image information is obtained by detecting this photocurrent synchronously with laser scan

**B75-10115**

**CHEMICAL-IONIZATION VISIBLE AND ULTRAVIOLET GAS LASERS A CONCEPT**

J B Laundenslager

Jun 1975

**NPO-13289**

Charge-transfer reactions or Penning ionization reactions are used to produce population inversions between electronic states of molecular ions which should result in stimulated emission in ultraviolet and visible regions Such lasers could be used in study of short-lived reaction intermediates crystal structure and scattering and photolysis

**B75-10116**

**HEAT-OPERATED CRYOGENIC ELECTRICAL GENERATOR**

T G Wang M M Saffern and D D Elleman

Jun 1975

**NPO-13303**

Generator operation is based upon unusual hydrodynamic properties exhibited by liquid helium below superfluid critical point Below that temperature liquid behaves as though it is mixture of two interpenetrating fluids When transition takes place between superfluid and normal states conservation of momentum is always balanced by normal fluid

**B75-10118**

**HIGH-ENERGY LASERS BY USING DISTRIBUTED REFLECTION A CONCEPT**

M M Saffren

Jun 1975

**NPO-13346**

Lasers may be made with higher energy photons than heretofore possible It has been proposed that vacuum ultraviolet lasing can be obtained by bombarding superfluid helium with electron beam while coupling acoustic energy into helium to set up standing waves in fluid

**B75-10119**

**LASER-TO-ELECTRICITY ENERGY CONVERTER FOR SHORT WAVELENGTHS**

J R Stirn and Y C M Yeh

Jun 1975

**NPO-13390**

Short-wavelength energy converter can be made using Schottky barrier structure It has wider band gap than p-n junction silicon semiconductors, and thus it has improved response at wavelengths down to and including ultraviolet region

**B75-10123**

**DOUBLE-DISCHARGE COPPER-VAPOR LASER**

J C Chen N M Merheim and G R Russell

Jun 1975

**NPO-13348**

Power supply for discharge pulses consists of two capacitors that are made to discharge synchronously with adjustable time intervals First pulse is switched with hydrogen thyatron and second by spark gap Lasing action peaks for appropriate combination of these two parameters

**B75-10124**

**QUARTZ CRYSTAL MICROBALANCES TO MEASURE WIND VELOCITY AND AIR HUMIDITY**

J B Stephens and E G Lave

Jun 1975

**NPO-13462**

Instrument includes four temperature-sensing Y-cut quartz crystals to determine wind direction velocity and temperature Two additional AT-cut crystals are used to determine air humidity Entire signal processing is provided by built-in electronics circuits

**B75-10125**

**SCHOTTKY BARRIER SOLAR CELL PROMISES IMPROVED EFFICIENCY**

R J Stirn

Jun 1975 See also B75-10119

**NPO-13482**

### 03 PHYSICAL SCIENCES

Higher current and higher voltage can be obtained by using Schottky barrier device with wide band-gap semiconductor as top layer and lower band-gap semiconductor underneath. Significant amount of solar radiation that is not absorbed by side band-gap material will be absorbed by narrow band-gap material.

**B75-10126**

#### **TRANSMISSION LINE FOR S-BAND MASERS**

R C Clauss and E R Wiebe

Jun 1975

**NPO-13504**

Transmission-line is coaxial. Its outer conductor is made of thin-wall stainless-steel tube, inside is plated with 0.0025 mm copper and 0.0003 mm gold. This combination gives little microwave loss and adequate thermal isolation.

**B75-10127**

#### **LASER ACTION GENERATED WITHIN A LIGHT PIPE A CONCEPT**

C Elachi, G A Evans, and C Yeh

Jun 1975

**NPO-13531**

Laser light could be generated within light pipe itself thereby eliminating coupling losses. Theoretical calculations have shown feasibility of light-pipe laser propagating in circularly-polarized TE mode. It is predicted that fiber-optic distributed-feedback laser would have gain on order of 25 dB.

**B75-10128**

#### **LASER USING LEAD CHLORIDE VAPOR**

C J Chen

Jun 1975

**NPO-13615**

By applying electric discharge lead chloride vapor in tube is dissociated into lead and chlorine atoms. Population inversion of lead atoms is attained subsequently by second discharge, before chemical recombination of lead and chlorine has occurred. Optimum time interval between two discharges is required for maximum laser output.

**B75-10138**

#### **LIFE PREDICTION OF MATERIALS EXPOSED TO MONOTONIC AND CYCLIC LOADING A TECHNOLOGY SURVEY AND BIBLIOGRAPHY**

W F Stuhke (Martin Marietta Corp.) J L Carpenter Jr (Martin Marietta Corp.) N Moya (Martin Marietta Corp.) and G Mandel. Aug 1975. See also B75-10139 NASA-CR-134750, NASA-CR-134751, NASA-CR-134752, NASA-CR-134-753, NASA-CR-134754.

**LEWIS-12502**

Announced survey directs attention toward low cycle fatigue and thermal fatigue experienced at elevated temperatures equivalent to those found in hot end of gas turbine engine. Majority of bibliographic references are on life prediction for materials exposed to monotonic and cyclic loading in high temperature environments.

**B75-10139**

#### **FRACTURE TOUGHNESS TESTING DATA A TECHNOLOGY SURVEY AND BIBLIOGRAPHY**

W F Stuhke (Martin Marietta Corp.) J L Carpenter Jr (Martin Marietta Corp.) N Moya (Martin Marietta Corp.) and G Mandel. Aug 1975. See also B75-10138, NASA-CR-134750, NASA-CR-134751, NASA-CR-134752, NASA-CR-134753, NASA-CR-134754.

**LEWIS-12503**

Announced survey includes reports covering fracture toughness testing for various structural materials including information on plane strain and developing areas of mixed mode and plane strain test conditions. Bibliography references cite work and conclusions in fracture toughness testing and application of fracture toughness test data, and in fracture mechanics analysis.

**B75-10141**

#### **LASER VELOCIMETER MEASUREMENTS OF HIGH-SPEED**

### **COMPRESSIBLE FLOWS**

D A Johnson

Jul 1975

**ARC-10781**

Laser velocimeter results were compared and found to be consistent with those obtained with conventional measurement techniques and existing compressible boundary layer theory. Turbulence information at supersonic speed has been successfully obtained in compressible boundary layer with laser system.

**B75-10142**

#### **QUICK-CHANGE ABSORPTION COLUMN**

G N McEwen Jr (Natl Res Council) and B A Williams

Jul 1975

**ARC-10952**

Column has end caps held in place by springs. Prefilled packs of absorbent can be exchanged quickly. Both ends of metal or plastic body tube of size which can hold adequate amount of absorbent are machined to provide seat for perforated plate and groove for its spring retainer ring.

**B75-10147**

#### **AN EXPERIMENTAL 100 KILOWATT WIND TURBINE GENERATOR**

R L Thomas, R L Puthoff, J M Savino, and W R Johnson

Aug 1975. See also NASA-TM-X-71701.

**LEWIS-12509**

Experimental generator consists of two blades mounted on 100 foot tower, driving transmission train and electric generator mounted on top of tower. Machine generates 100 kW of electricity at wind speeds from 18 to 60 miles per hour. Yaw control mechanism automatically orients machine into wind.

**B75-10149**

#### **INVESTIGATIONS OF MULTIPLE JETS IN A CROSSFLOW**

R E Walker (Aerojet-Gen Corp.) and D L Kors (Aerojet-Gen Corp.)

Oct 1975. See also NASA-CR-121217.

**LEWIS-12102**

Study was conducted to determine penetration and mixing characteristics of multiple jets of ambient temperature air injected perpendicularly into ducted mainstream of hot combustion gases.

**B75-10158**

#### **ANGULAR DEVICE FOR OPTICAL FILTERS**

L W Overbay

Aug 1975

**LANGLEY-11796**

Device provides a means for precise angular adjustment of optical filters in Raman calibration detector units. Device prevents stray light from entering system and has the capability of repeated alignments to predetermined angles.

**B75-10160**

#### **AUTOMATED ELECTRONIC SYSTEM FOR MEASURING THERMOPHYSICAL PROPERTIES**

T R Creel, Jr, R A Jones, R R Corwin (Beta Industries Inc.) and J S Kramer (Beta Industries Inc.)

Aug 1975. See also B73-10447, NASA-CR-2511.

**LANGLEY-11883**

Phase-charge coatings are used to measure surface temperature accurately under transient heating conditions. Coating melts when surface reaches calibrated phase-charge temperature. Temperature is monitored by infrared thermometer and corresponding elapsed time is recorded by electronic data-handling system.

**B75-10176**

#### **COMPACT LASER THROUGH IMPROVED HEAT CONDUCTANCE**

L C Yang

Aug 1975

**NPO-13147**

A 16-joule-pulse laser has been developed in which a boron nitride heat-conductor enclosure is used to remove heat from



the elements Enclosure is smaller and lighter than systems in which cooling fluids are used

**B75-10181**

**A TWO-DEGREE KELVIN REFRIGERATOR**

J B Stephens and C G Miller

Aug 1975

**NPO-13459**

Open-cycle cryogenic refrigerator maintains temperature as low as 2K for periods up to six months Designed to cool an infrared detector refrigerator can be used in cooling Josephson-junction devices magnetic bubble domains and superconducting devices

**B75-10182**

**ECONOMICAL SOLAR-HEATING OR COOLING SYSTEM WITH NEW SOLAR-ENERGY CONCENTRATORS**

K Shimada

Aug 1975

**NPO-13497**

Economical solar energy collector, made from array of cylindrical Fresnel lenses does not require tracking mechanism As the sun changes position lenses focus solar energy on different collector elements

**B75-10183**

**HIGH-POWER CW LASER USING HYDROGEN-FLUORINE REACTION**

P I Moynihan

Aug 1975

**NPO-13623**

Continuous-wave laser has been proposed based on reaction of hydrogen and fluorine Hydrogen is produced by dissociation of hydrazine which can be stored as liquid in light containers at room temperature

**B75-10185**

**CHARACTERISTICS AND PERFORMANCE STUDY OF MASS SPECTROMETER RESIDUAL GAS ANALYZERS**

W W Hultzman

Sep 1975 See also NASA-TN-D-7554

**LEWIS-12393**

Types of instruments studied were magnetic sector, omega-tron quadrupole, and monopole Experimental results obtained included absolute sensitivity to argon relative sensitivity to ten gases (hydrogen helium neon nitrogen carbon monoxide oxygen argon, carbon dioxide krypton and xenon) and cracking patterns for these gases

**B75-10189**

**COMPARATIVE PERFORMANCE OF TWENTY-THREE TYPES OF FLAT PLATE SOLAR ENERGY COLLECTORS**

F F Simon

Sep 1975 See also B74-10086 NASA-TM-X-3059, NASA-TM-X-71793

**LEWIS-12511**

Report compares efficiencies of 23 solar collectors for four different purposes operating a Rankine-cycle engine heating or absorption air conditioning heating hot water and heating a swimming pool

**B75-10202**

**WIDE-ANGLE SUN SENSORS**

L L Schumacher

Sep 1975

**NPO-13327**

Two sensors have been developed one single-axis device is cylindrical the other, two-axis device is spherical Multiple surface deposits of photosensitive material such as cadmium sulfide serve as redundancy ensuring high reliability

**B75-10206**

**DIFFUSED GUIDES FOR DISTRIBUTED-FEEDBACK LASERS**

C Elachi

Sep 1975 See also B75-10127

**NPO 13544**

Proposed waveguide is hollow cylindrical pipe Inside channel surface is infused with gas or metal molecules, forming periodic cross sections along entire length Light is scattered at periodic infusions resulting in distributed feedback Configuration is suited for capillary gas lasers

**B75-10210**

**SECONDARY REFLECTORS FOR ECONOMICAL SUN-TRACKING ENERGY COLLECTION SYSTEM A CONCEPT**

C G Miller and J B Stephens

Sep 1975 See also B75-10209

**NPO 13580**

Mechanism is simpler and lower in cost because it moves heat-collector pipe to stay in focus with sun instead of moving heavy reflectors

**B75-10223**

**OPTICAL FEEDBACK TECHNIQUE EXTENDS FREQUENCY RESPONSE OF PHOTOCONDUCTORS**

S J Katzberg

Oct 1975 See also NASA-TN-D-7727

**LANGLEY-11768**

Feedback circuit consists of high-gain light-to-voltage converter with frequency-limited nonlinear photoconductor inside feedback loop Feedback element is visible light-emitting diode with light-out versus current-in characteristic that is linear over several decades

**B75-10224**

**GUST ALLEVIATION SYSTEM TO IMPROVE RIDE COMFORT OF LIGHT AIRPLANES**

E C Stewart W H Phillips and D E Hewes

Oct 1975

**LANGLEY-11771**

System consists of movable auxiliary aerodynamic sensors mounted on fuselage and connected to trailing-edge flaps by rigid mechanical linkages System achieves alleviation by reducing lift-curve slope of airplane to such a small value that gust-induced angles of attack will result in small changes in lift

**B75-10226**

**APPLICATION OF MONOCHROMATIC OCEAN WAVE FORECASTS TO PREDICTION OF WAVE-INDUCED CURRENTS**

L R Poole

Oct 1975 See also NASA-TN-D-7861

**LANGLEY-11809**

Stokes wave-induced currents are compared, for variety of wind conditions resulting in partially developed seas and for two water depths with currents induced by average and significant monochromatic waves related to Bretschneider spectrum

**B75-10227**

**NEW AIRCRAFT INSTRUMENT INDICATES TURBULENCE INTENSITY**

R A Champine and C W Meissner Jr

Oct 1975

**LANGLEY-11833**

System consists of accelerometer, indicator and necessary electronic circuits for summing and averaging accelerations Averaging-time feature enables pilot to see large values of accelerations over a short time or smaller accelerations over longer period of time

**B75-10228**

**VISUAL ALIGNMENT AID**

J M Franke

Oct 1975

**LANGLEY-11842**

Device consists of beam-splitter cube and two 90 deg prisms cemented together Various components can be made as two pieces eliminating seams except beam-splitter diagonal

### 03 PHYSICAL SCIENCES

**B75-10229**

**STEAM AUTOMOBILE ANALYSIS**

J A Peoples

Oct 1975

**M-FS-23188**

Report includes many charts that present graphically the effects of design parameters on performance. Equations and data are given which can assist designer in selecting among such factors as working medium, horsepower, and engine components.

**B75-10232**

**LEVITATION OF OBJECTS USING ACOUSTIC ENERGY**

R R Whymark (Intersonics Inc.)

Oct 1975

**M-FS-23261**

Activated sound source establishes standing-wave pattern in gap between source and acoustic reflector. Solid or liquid material introduced in region will move to one of the low pressure areas produced at antinodes and remain suspended as long as acoustic signal is present.

**B75-10235**

**MULTISPECTRAL DATA ANALYSIS LARSYS III**

D A Landgrebe (Purdue Univ.)

Oct 1975

**MSC-14823**

System uses pattern recognition and interactive data handling techniques applied to remotely sensed data. Basic analysis concept consists of locating data points which are believed to be representative of classes of interest.

**B75-10236**

**TABLE-LOOKUP ALGORITHM FOR PATTERN RECOGNITION ELLTAB (ELLIPTICAL TABLE)**

W C Jones, III and W G Eppler

Oct 1975 See also B75-10235

**MSC-14866**

Remotely sensed unit is assigned to category by merely looking up its channel readings in four-dimensional table. Approach makes it possible to process multispectral scanner data using a minicomputer.

**B75-10237**

**AUTOMATIC SOLAR TRACKER**

B L Conroy

Oct 1975

**NPO-13630**

Mechanism uses differential pressure of condensable fluid against fixed piston to equalize radiant energy on pair of blackbody elements.

**B75-10239**

**SOFT X-RAY LASERS USING DISTRIBUTED-FEEDBACK REFLECTION A CONCEPT**

F J Grunthaner

Oct 1975

**NPO-13532**

Proposed arrangement consists of large evacuated chamber containing smaller Dewar chamber into which liquid neon is introduced. Zeolite crystal is mounted in wall of chamber with one side in contact with neon and other exposed to evacuated chamber. Electron gun is used to bombard crystal.

**B75-10244**

**CALCULATION PROCEDURE FOR TRANSIENT HEAT TRANSFER TO A COOLED PLATE IN A HEATED STREAM WHOSE TEMPERATURE VARIES ARBITRARILY WITH TIME**

J Sucec

Nov 1975 See also NASA-TM-X-3238

**LEWIS-12558**

Heat transfer equations have been developed to calculate surface temperature and surface heat flux for cooled flat plate when temperature of fluid passing over leading edge varies arbitrarily.

**B75-10245**

**A NEW HIGH TEMPERATURE NOBLE METAL THERMOCOUPLE PAIRING**

G E Glawe

Nov 1975

**LEWIS-12545**

Investigation has revealed reasonably oxidation resistant thermocouple pairing suitable for use in combustor gas streams at temperatures above 1873 K and at pressures above 20 atmospheres.

**B75-10248**

**VARIABLE-VOLUME ATOMIC STORAGE VESSEL FOR HYDROGEN MASERS**

H F Peters

Oct 1975

**GSFC-11895**

Vessel located in maser cavity is made from cylindrical, convoluted flexible bellows which can be expanded or contracted along the cylinder axis vertically. Inner surface area remains constant with changing volume, permitting measurement of frequency deviations of excited atoms.

**B75-10250**

**OPTICAL DESIGN COMPUTER PROGRAM LENS II**

Oct 1975

**GSFC-11951**

Differential-correction program evaluates optical lens design.

**B75-10256**

**DESIGN PROCEDURE FOR LOW-DRAG SUBSONIC AIRFOILS**

J B Peterson and A B Chen (National Res Council)

Oct 1975

**LANGLEY-11351**

Airfoil has least amount of drag under given restrictions of boundary layer transition position, lift coefficient, thickness ratio, and Reynolds number based on airfoil chord. It is suitable for use as wing and propeller aircraft sections operating at subsonic speeds and for hydrofoil sections and blades for fans, compressors, turbines, and windmills.

**B75-10262**

**TUNEABLE DIODE LASER SPECTROMETER WITH INTEGRAL GRATING**

P C vonThuna (Arthur D Little Inc.)

Oct 1975

**LANGLEY-11830**

Grating is used in place of required folding mirror. Arrangement eliminates separate monochromator unit and uses retroreflector for alignment.

**B75-10266**

**INCREASING TERMINAL STRIP EFFICIENCY AT CRYOGENIC TEMPERATURES**

L B Holdeman

Oct 1975

**M-FS-23234**

Single-crystal sapphire and quartz have been used to fabricate thermally shorting, electrically insulating terminal boards for incorporation in metal heat-sink blocks.

**B75-10268**

**SINGLE CRYSTALS OF METAL SOLID SOLUTIONS A STUDY**

J F Miller (Battelle Memorial Institute) and S H Gelles (Battelle Memorial Institute)

Oct 1975

**M-FS-23268**

Report describes growth of silver-alloy crystals under widely varying conditions of growth rate, temperature gradient, and magnetic field. Role of gravitation and convection on crystal substructure is analyzed, as well as influence of magnetic fields applied during crystallization.

**B75-10272****ULTRAVIOLET HYDROGEN-DISCHARGE LAMP**

D E Kerr (Johns Hopkins Univ)

Oct 1975 See also NASA-CR-140316

**MSC-14793**

Device provides stable flux output for calibration of ultraviolet spectrum

**B75-10279****REFLECTED-WAVE MASER**

R C Clauss

Oct 1975

**NPO-13490**

Reflected wave maser amplifier has significantly greater bandwidth than conventional maser amplifiers. Unit needs no retuning to receive wide range of frequencies.

**B75-10285****APPARATUS FOR STUDY OF PLASMAS AT ELEVATED TEMPERATURES**

J D Christian and W P Gilbreath

Nov 1975

**ARC-10958**

Microwave discharge plasmas take place within heated zone. Changes in weight of specimens in plasma as well as temperature of sample and plasma can be obtained, facilitating determinations of reaction rates and recombination coefficients.

**B75-10286****SOUND SEPARATION PROBE**

M T Moore (GE) and E B Smith (GE)

Nov 1975

**LEWIS-12507**

Probe separates sound waves from turbulent flow pressure fluctuations in ducted airstreams by using principle that sound waves and turbulent flow pressure perturbations travel at different velocities.

**B75-10288****INDUCTION HEATING SIMPLIFIES METAL EVAPORATION FOR ION PLATING**

T Spalvins and W A Baird

Dec 1975

**LEWIS-12595**

Evaporation by induction heating produces significant degree of metal ionization, enhancing degree of penetration of evaporant on substrate.

**B75-10305****READ-ONLY OPTICAL STORAGE MEDIUM**

R A Gange (RCA)

Dec 1975

**M-FS-23169**

Photosensitive recording medium consists of thin-film silicone resin deposited on photoconductive substrate. Medium is useful for holographic interferometry studies.

**B75-10307****SIGNAL MIXER FOR OPTICAL HETERODYNE RECEIVER**

S Levinson (United Aircraft Corp)

Dec 1975

**M-FS-23251**

Incoming signal is mixed with local oscillator signal by a beam splitter inside laser cavity. Laser power can be reduced by 50 to 100 times.

**B75-10311****THE IMPACT OF WATER ON FREE-FALLING BODIES**

H A Wright (Bolt Beranek and Newman Inc), P J Remington (Bolt Beranek and Newman Inc) and R Madden (Bolt Beranek and Newman Inc)

Dec 1975

**M-FS-23310**

Report discussed measures to cushion impact on body falling into water. Heavy loads are generated by impact and by pressures of water cavity collapsing onto the body.

**B75-10315****OPTICAL-NOISE SUPPRESSION UNIT A CONCEPT**

J L Horner (Dept of Transportation)

Dec 1975

**MSC-12640**

Device is used with coherent optical-processing spatial-filtering computer. It is inexpensive to manufacture and is made from readily available standard components. Its alignment is not critical.

**B75-10328****ELECTRO-OPTICAL DETECTOR TO IMPROVE SENSITIVITY OF A FOCAL-PLANE MASS SPECTROMETER**

C E Giffin

Dec 1975

**NPO-13524**

Wedge-shaped microchannel electron multiplier array has been proposed to improve sensitivity of focal-plane mass spectrometer by two to four orders of magnitude.

**B75-10329****COLLIMATION OF ELECTRON AND X-RAY BEAMS USING ZEOLITE CRYSTALS**

F J Grunthaner

Dec 1975

**NPO-13557**

Zeolite crystals can be used to collimate electron and X-ray beams. Faujasite, naturally occurring crystal in this group, provides structure necessary for collimation.

**B75-10332****DEVELOPMENTS IN SPECTROPHOTOMETRY I AN INSTRUMENT FOR HIGH-RESOLUTION MEASUREMENTS OF OPTICAL INTENSITY AND POLARIZATION**

A L Fymat

Dec 1975 See also B75-10333 B75-10335 B75-10338

**NPO-13604**

Device has resolution required to analyze polarization of the spectra of unknown gases, liquids or solids (or a mixture of these phases). Such resolution has not been available on conventional instruments.

**B75-10333****DEVELOPMENTS IN SPECTROPHOTOMETRY II A MULTIPLE-FREQUENCY PARTICLE-SIZE SPECTROMETER**

A L Fymat

Dec 1975 See also B75-10332 B75-10334 B75-10338

**NPO-13606**

Instrument can be used to remotely determine complete spectrum of sizes of particles of unknown composition suspended in gas or liquid. Device does not require direct physical sample of particles.

**B75-10335****DEVELOPMENTS IN SPECTROPHOTOMETRY III MULTIPLE-FIELD-OF-VIEW SPECTROMETER TO DETERMINE PARTICLE-SIZE DISTRIBUTION AND REFRACTIVE INDEX**

A L Fymat

Dec 1975 See also B75-10332 B75-10333 B75-10338

**NPO-13614**

Instrument is based on inverse solution to equations for light scattered by a transparent medium. Measurements are taken over several angles of incidence rather than over several frequencies. Measurements can be used to simultaneously determine chemical and physical properties of particles in mixed gas or liquid.

## 04 MATERIALS/CHEMISTRY

### B75-10007

**LIGHTWEIGHT PROTECTIVE CLOTHING FOR THE SAFE HANDLING OF HIGH-INTENSITY PRESSURIZED LAMPS**  
J G Ewashinka

Mar 1975 See also NASA-TM-X-3147

### LEWIS-12073

Five commercially available clothing materials, selected for their high cutting resistance high strength light weight and pliability were tested by exposing them to exploding lamps located less than 60 cm (2 ft) away Face shield material tested initially was commercial high-strength polycarbonate plastic

### B75-10016

**THIN KAPTON POLYIMIDE FILMS VACUUM FORMED AT HIGH TEMPERATURE RETAIN THEIR SHAPE AT TEMPERATURES TO 450 K (350 F)**

K F Burr (Union Carbide Corp) and G E Nies (Union Carbide Corp)

Apr 1975 See also NASA-CR-121166

### LEWIS-12412

Purpose of investigation was to identify candidate materials for self-evacuating multilayer insulation systems to be used on liquid hydrogen tanks on space shuttle which would survive re-entry temperatures and mechanical and thermal cycling of one hundred flights

### B75-10023

**HIGH STRENGTH FORGEABLE TANTALUM BASE ALLOY**  
R W Buckman Jr (Westinghouse Elec Corp)

May 1975 See also B66-10558, B71-10010 NASA-CR-120818, NASA-CR-120931, NASA-CR-121096 NASA-CR-134606

### LEWIS-11386

Increasing tungsten content of tantalum base alloy to 12-15% level will improve high temperature creep properties of existing tantalum base alloys while retaining their excellent fabrication and welding characteristics

### B75-10027

**METHOD FOR EVALUATING EFFECTIVENESS OF DRY FIRE-EXTINGUISHING CHEMICALS**

R L Altman  
Feb 1975

### ARC-10869

Apparatus used in method is commercially available powder-deposition type oxy-acetylene torch that has been modified to provide electronically timed operations and more uniform powder flow, usual torch tips are replaced by burner head with pilot flame

### B75-10038

**CURABLE POLYPHOSPHAZENES**

K A Reynard (Horizons Res Inc) and A H Gerber (Horizons Res, Inc)

Apr 1975

### M-FS-23134

Class of polyphosphazene polymers can be cured at moderate temperatures by action of moisture In addition polymers maintain flexibility when exposed to low temperatures

### B75-10042

**HIGH-TEMPERATURE, REUSABLE SURFACE INSULATION SYSTEM**

Innovator not given (Lockheed Missiles and Space Co) Apr 1975 See also NASA-CR-115582 NASA-CR-115583 NASA-CR-115712, NASA-CR-134326 NASA-CR-134327

### MSC-14688

System is capable of withstanding extreme temperature environments ranging from -250 to 2300 F (116 K to 1543 K) System includes impervious, high-density high-thermal-emittance outer coating which has low coefficient of thermal expansion matching that of insulation

### B75-10056

**LOW-DENSITY POLYBENZIMIDAZOLE FOAMS FOR**

## Thermal Insulation and Fire Protection

D A Kourtides J A Parker C Deland (Whittaker Corp) and R Milligan (Whittaker Corp)

Apr 1975

### ARC-10823

Fire-resistant and nonsmoking foam can be prepared in desirable density range of 24 to 50 kg/cu m by controlled thermal crosslinking of polybenzimidazole prepolymer Reproducible foams of specific density can be produced by controlling volatile content and melting temperature of prepolymer

### B75-10062

**FIBER-MODIFIED POLYURETHANE FOAM FOR BALLISTIC PROTECTION**

R H Fish, J A Parker and R W Rosser

Apr 1975

### ARC-10714

Closed-cell semirigid fiber-loaded self-extinguishing polyurethane foam material fills voids around fuel cells in aircraft Material prevents leakage of fuel and spreading of fire in case of ballistic incendiary impact It also protects fuel cell in case of exterior fire

### B75-10066

**FABRICATION OF COMPOSITE FAN BLADES USING PMR A-TYPE POLYIMIDE RESIN AND GRAPHITE FIBER REINFORCEMENT**

W E Winters (TRW Equipment) and P J Cavano (TRW Equipment)  
Jul 1975 See also B71-10442, NASA-CR-134727

### LEWIS-12366

PMR polyimides are safe easy to handle can be processed with relatively wide process controls and offer excellent mechanical properties with thermo-oxidative stability Procedures staging and cure schedules fully dense crackfree, dimensionally controlled complex structure high tip speed fan blades 1.27 cm (0.5 in) thick

### B75-10067

**SURVEY OF COATINGS FOR SOLAR COLLECTORS**

G E McDonald

Jul 1975 See also NASA-TM-X-3136 NASA-TM-X-71730

### LEWIS-12510

Optimum solar selective properties of black chrome require some tailoring of current and time for plating solution being used Black zinc is produced from high zinc electroplate by subsequent conversion with chromate dip Measurements have also been made of reflectance of previously known solar selective coatings of black copper and electroplated black nickel

### B75-10072

**FILM MOUNTING METHOD FOR THERMOMECHANICAL ANALYSIS**

H D Burks

May 1975

### LANGLEY-11330

Mounting clamps attach polymeric film sample to thermomechanical analyzer Using this technique temperature at which polymer passes from relatively nonflexible or glasslike state to rubbery condition where it exhibits marked increase in flow properties is readily determined

### B75-10076

**THERMOELECTRICALLY-COOLED QUARTZ MICROBALANCE**

D McKeown (Faraday Labs Inc)

May 1975

### M-FS-23101

Temperature of microbalance can be maintained at ambient temperature or held at some other desired temperature Microbalance has two-stage thermoelectric device that controls temperature of quartz crystal Heat can be pumped to or from balance by Peltier effect

### B75-10084

**DIELECTRIC FILMS IMPROVE LIFE OF POLYMERIC INSULATORS**

M Hudis and T Wydeven

May 1975

**ARC-10892**

Degradation of polymeric insulators may be significantly reduced when polymer surfaces are coated with film having gradation of dielectric constants larger where it is in contact with polymer and smaller at its exposed surface

**B75-10104**

**METHOD OF ATTACHING INSULATION TILES**

L J Leger

Jun 1975

**MSC-12619**

Felt pads attached underneath tiles add very little weight and retain flexibility at low temperatures. Very thin layer of room-temperature vulcanizing silicone adhesive is applied to tile. Then felt pad is attached to adhesive. Finally, tile-felt combination is attached to metal surface by means of similar adhesive layer.

**B75-10113**

**PROCESSING FOR OBTAINING GOOD QUALITY WATER FROM SEWAGE**

M F Humphrey

Jun 1975

**NPO-13224**

Sewage treatment method incorporates aqueous slurry of activated carbon and ash. Process eliminates smell and greatly reduces amounts of solids requiring disposal. Solids consist only of sterile ash.

**B75-10117**

**IMPROVED ION EXCHANGE MEMBRANE**

A Rembaum, S P S Yen and E Klein

Jun 1975

**NPO-13309**

Membrane, made from commercially-available hollow fibers is used in reverse osmosis or dialysis. Fiber has skin layers which pass only small molecules. Macromolecules cannot penetrate skin. Fibers can also be used to remove other undesirable anions, such as phosphate, sulfate, carbonate and uranium in form of uranium-sulfate complex.

**B75-10121**

**IONENE TREATMENT OF SURFACES STIMULATES CELL GROWTH**

A Rembaum, M Ingram, A S Schmink and D E Rounds (Pasadena Found for Med Res)

Jun 1975

**NPO-13421**

Number of cells adhering to walls of container can be increased by chemically pretreating walls. Polyelectrolyte ionene, gives more effective pretreatment than any currently used chemicals.

**B75-10137**

**TAILOR MAKING HIGH PERFORMANCE GRAPHITE FIBER REINFORCED PMR POLYIMIDES**

T T Serafini and R D Vannucci

Jul 1975 See also B71-10442 NASA-TM-X-71616 NASA-TN-D-6877

**LEWIS-12416**

Studies have demonstrated versatility of PMR approach for tailor making polyimide matrix resins with wide range of flow characteristics. By simply adjusting molar ratio of reactants in monomer mixture, resins having flow values of as much as 20% can be achieved.

**B75-10144**

**REFLECTING HEAT SHIELDS MADE OF MICROSTRUCTURED FUSED SILICA**

W M Congdon (Martin Marietta Corp)

Jul 1975 See also NASA-CR-137574

**ARC-10949**

Heat shields constructed from selected monodisperse distributions of high-purity fused-silica particles are efficient

reflectors of visible and near-UV radiation generated in shock-layer of space probe during atmospheric entry

**B75-10157**

**DETERMINATION OF WATER CONTENT USING MASS SPECTROMETRY**

G M Wood, B T Upchurch (Old Dominion Coll) and D B Hughes (E I du Pont de Nemours and Co)

Aug 1975

**LANGLEY-11774**

Mass spectrometer is used to measure small quantities of water present in different materials. System has been applied in measuring water and gases desorbed from microcircuitry insulation. can also be used with foods, polymeric materials and organic solvents.

**B75-10159**

**DYNAMIC DELTA METHOD FOR TRACE GAS ANALYSIS**

G M Wood, B T Upchurch (Old Dominion Coll) and D B Hughes (E I du Pont de Nemours and Co)

Aug 1975

**LANGLEY-11800**

Method has been developed in which measurements are made only over viscous flow range, eliminating fractionation before the molecular leak and problems due to surface elution.

**B75-10163**

**FABRICATION OF POROUS PLUGS FOR CONTROL OF LIQUID HELIUM**

L B Holdeman (Nat'l Res Council)

Aug 1975

**M-FS-23218**

Method of producing porous copper plugs combines hydrogen annealing and oxygen annealing. Plugs have high thermal conductivity and small pore size.

**B75-10174**

**NONGASSING NICKEL BATTERY CELL**

G L Juvinall, E M Cohn, A A Uchiyama and H A Frank

Aug 1975

**NPO-11853**

Method of constructing nickel cadmium batteries prevents excessive gas buildup and allows hermetic sealing of battery for increased service life and reduced maintenance cost.

**B75-10178**

**IMPROVED MULTIPLE-TARGET SPUTTERING EQUIPMENT**

R Shima

Aug 1975

**NPO-13345**

Sputtering chamber has been developed with multiple target. Several film layers can be deposited without repeated evacuation and refilling. Contamination through exposure to air is eliminated.

**B75-10193**

**RISK MANAGEMENT TECHNIQUE FOR LIQUEFIED NATURAL GAS FACILITIES**

O H Fedor and W N Parsons (Boeing Co)

Sep 1975 See also NASA-CR-139183

**KSC-11005**

Checklists have been compiled for planning, design, construction, startup and debugging and operation of liquefied natural gas facilities. Lists include references to pertinent safety regulations. Methods described are applicable to handling of other hazardous materials.

**B75-10198**

**HANDBOOK FOR ESTIMATING TOXIC FUEL HAZARDS**

R K Dumbauld (GCA Corp), J R Jorkland (GCA Corp), H E Cramer (GCA Corp) and F A Record (GCA Corp)

Sep 1975

**M-FS-21114**

Computer program predicts, from readily available meteorological data, concentration and dosage fields downwind from ground-level and elevated sources of toxic fuel emissions.

#### 04 MATERIALS/CHEMISTRY

Mathematical model is applicable to hot plume rise from industrial stacks and should also be of interest to air pollution meteorologists

##### B75-10200

##### ALUMINUM ALLOYS WITH IMPROVED STRENGTH

R Deiasi (Grumman Aerospace Co) and P Adler (Grumman Aerospace Co)

Sep 1975

##### M-FS-23239

Mechanical strength and stress corrosion of new BAR and 7050 alloys that include Zn instead of Cr have been studied and compared with those of 7075 aluminum alloy. Added mechanical strength of new alloys is attributed to finer grain size of 5 to 8 micrometers, however susceptibility to stress corrosion attack is increased.

##### B75-10207

##### LIQUID ETHYLENE-PROPYLENE COPOLYMERS

R A Rhein, J D Ingham and M F Humphrey

Sep 1975

##### NPO-13555

Oligomers are prepared by heating solid ethylene-propylene rubber in container that retains solid and permits liquid product to flow out as it is formed. Molecular weight and viscosity of liquids can be predetermined by process temperature. Copolymers have low viscosity for given molecular weight.

##### B75-10225

##### CHEMICAL EQUILIBRIUM OF ABLATION MATERIALS INCLUDING CONDENSED SPECIES

C W Stroud and K L Brinkley

Oct 1975

##### LANGLEY-11801

Equilibrium is determined by finding chemical composition with minimum free energy. Method of steepest descent is applied to quadratic representation of free-energy surface. Solution is initiated by selecting arbitrary set of mole fractions from which point on free-energy surface is computed.

##### B75-10231

##### SOLAR-CELL INTERCONNECTS

Innovator not given (EMR Aerospace Sciences) Oct 1975

##### M-FS-23257

Study findings concluded that useful bonds can be formed with silver ribbon, silver-plated copper ribbon and aluminum ribbon. Bonds were formed at from 300 C to 400 C and with enough contact pressure to produce some deformation of ribbon.

##### B75-10246

##### SUPERIOR HIGH TEMPERATURE PROPERTIES AVAILABLE IN DIRECTIONALLY SOLIDIFIED NICKEL-BASE EUTECTIC ALLOYS

F D Lemkey (United Technologies Corp)

Nov 1975 See also NASA-CR-2278

##### LEWIS-12562

Alloy has high temperature properties exceeding strength of all known superalloys. It exhibits inherent resistance to oxidation and high temperature hot corrosion.

##### B75-10271

##### INFLUENCE OF HEAT TREATMENT ON MECHANICAL PROPERTIES OF 300M STEEL

L J Youngblood and M Raghavan (National Res Council)

Oct 1975

##### MSC-14792

Tests show that 300M steel should be austenitized at temperatures above 1800 deg F to yield best combination of strength and thickness. Tempering should be performed at temperatures between 400 and 600 deg F.

##### B75-10280

##### IMPROVED POLYELECTROLYTE FOR ION EXCHANGE FIBERS

A Rembaum

Oct 1975

##### NPO-13530

Technique increases ion exchange capacity of hollow-fiber-substrate ion exchange resins. Procedure increases number of quaternary sites on polyquaternary copolymer by 15 to 35 percent.

##### B75-10290

##### CERAMIC THERMAL PROTECTIVE COATING WITHSTANDS HOSTILE ENVIRONMENT OF ROTATING TURBINE BLADES

C H Liebert and S Stecura

Dec 1975

##### LEWIS-12554

Ceramic coatings have low thermal conductivity. They provide potential for increased engine performance, reduced fuel consumption, use of less costly materials or construction procedures and increased life and durability.

##### B75-10293

##### LOW-COST THIN-LAYER SILICON SOLAR CELLS

L T Chu (Southern Methodist Univ)

Dec 1975

##### GSFC-12023

Two methods have been found to lower cost of polycrystalline silicon solar cells. Successive layers of polycrystalline silicon are deposited over supporting substrates of relatively inexpensive metallurgical-grade polycrystalline silicon, graphite or steel.

##### B75-10308

##### CONTACT-EUTECTIC-LENS FABRICATION TECHNIQUE

G F Allen (California Univ), S A Yue (California Univ) and G J Yu (California Univ)

Dec 1975

##### M-FS-23275

Method enables use of crystal or semiconductor materials with selective spectral-response characteristics (ultraviolet, visible or infrared wavelengths) in fabrication of contact lenses, reading glasses and photographic processing equipment.

##### B75-10310

##### FLAMMABILITY STUDY OF MATERIALS IN OXYGEN ENVIRONMENTS

G J Austin, W J Bransford, and F C Key

Dec 1975

##### M-FS-23306

Report presents flame-propagation rates and flammability ratings of 780 specimens of commercially available plastics, elastomers, coatings, fabrics, and other sheet materials. Test results are also given for over 1970 samples of most commonly used electrical harnesses, connectors and potting compounds.

##### B75-10314

##### USING PERMEABLE MEMBRANES TO PRODUCE HYDROGEN AND OXYGEN FROM WATER

P A Sanders, J R Williams, R W Downs and H McBryar

Dec 1975

##### MSC-12600

Concept may make it profitable to obtain hydrogen fuel from water. Laboratory tests have demonstrated that method enables decomposition of water several orders of magnitude beyond equilibrium state where only small amounts of free hydrogen are present.

##### B75-10320

##### A FLAME-RESISTANT MODIFIED POLYSTYRENE

W D Karle (Ultrasystems Inc), H R Kratze (Ultrasystems Inc) and L K Paciorek (Ultrasystems, Inc)

Dec 1975 See also NASA-CR-141932

##### MSC-14903

Several modified polystyrenes have been developed that are self-extinguishing in air. Information is included in report that also describes molding and fabrication properties, toxicology, and thermal behavior of the polymers.

##### B75-10321

##### REPAIR OF DAMAGED INSULATION TILES

D Mui (Rockwell Intern Corp)

Dec 1975 See also B75-10042, B75-10104

**MSC-19549**

High-temperature reusable surface insulation tiles are repaired quickly and economically using prefabricated tile plugs

**B75-10327****COVALENT BONDING OF POLYCATIONS TO SMALL POLYMERIC PARTICLES**

A Rembaum

Dec 1975 See also B75-10336

**NPO-13487**

Process produces small spherical polymeric particles which have polycations bound to them. In emulsion form particles present large positively charged surface which is available to absorb polyanions. This properly can be used in removing heparin from blood or bile acids from the digestive tract. Other anions such as DNA and RNA can also be removed from aqueous solutions.

**B75-10336****NEW UREA-ABSORBING POLYMERS FOR ARTIFICIAL KIDNEY MACHINES**

W A Mueller, G C Hsu, and H E Marsh

Dec 1975 See also B75-10327

**NPO-13620**

Etherified polymer is made from modified cellulose derivative which is reacted with periodate. It will absorb 2 grams of urea per 100 grams of polymer. Indications are that polymers could be used to help remove uremic wastes in artificial kidneys, or they could be administered orally as therapy for uremia.

**B75-10339****RECONSTITUTED ASBESTOS MATRIX FOR FUEL CELLS**

H McBryar

Dec 1975

**MSC-12568**

Method is described for reprocessing commercially available asbestos matrix stock to yield greater porosity and bubble pressure (due to increased surface tension) improved homogeneity and greater uniformity.

## 05 LIFE SCIENCES

**B75-10030****ACCELERATION OF THE AGING PROCESS BY OXYGEN**

J Miquel, R P Lunderen, and G K Bensch (Stanford Univ)

Feb 1975

**ARC-10928**

Tissue changes induced by hyperoxia have been compared with those of normal aging. Results of investigations using male flies prompt conclusion that normal aging, radiation syndrome and hyperoxic injury share at least one common feature--lipid peroxidation damage to all membranes resulting in accumulation of age pigment.

**B75-10041****PORTABLE AUTOMATIC BLOOD ANALYZER**

L P Coleman (Orion Res Inc)

Apr 1975 See also NASA-CR-134373

**MSC-14627**

Analyzer employs chemical-sensing electrodes for determination of blood gas, and ion concentrations. It is rugged, easily serviced, and comparatively simple to operate. System can analyze up to eight parameters and can be modified to measure other blood constituents including nonionic species such as urea, glucose, and oxygen.

**B75-10045****IMPROVED EXTRACTION TECHNIQUE FOR BIOLOGICAL FLUIDS**

V J Jahnsen

Apr 1975 See also B74-10213

**NPO-13084**

Liquid-liquid extraction technique speeds up separation of biological fluids into number of compounds. This eliminates agitation, emulsion formation, centrifugation, mechanical separation of phases, filtration, and other steps that have been used previously. Extraction efficiencies are equal or better than current manual liquid-liquid extraction techniques.

**B75-10051****SUBMINIATURE TRANSDUCERS FOR MEASURING FORCES AND DEFORMATION OF HEART MUSCLE**

C Feldstein, V J Osher, W G Lewis, H R Silver, and N E Duran

Apr 1975

**NPO-13423, NPO-13519**

Two subminiature transducers, one measuring muscle forces and one measuring muscle displacement, can be inserted into heart muscle without interfering with it. Probe, approximately 1 mm (0.04 in), causes no damage to heart muscle. Probe can be rotated to different positions to measure muscle forces from various directions.

**B75-10057****HAND TREMOR AND ACTIVITY SENSOR**

E Konigsberg (Konigsberg Instruments Inc)

Apr 1975

**ARC-10849**

System detects hand tremor and activity and transmitting signals over distance of at least 3 meters to receiver system. Designed for use in studies of effect of fatigue on individual's judgement or reaction time, sensor is installed within mounting of finger-ring; no external wiring or power source is needed.

**B75-10061****ULTRASTRUCTURAL ALTERATION OF MOUSE LUNG BY PROLONGED EXPOSURE TO MIXTURES OF HELIUM AND OXYGEN**

A G Harrison and D J Solomon (Union Carbide Corp)

Apr 1975

**ARC-10929**

Observed changes consist mainly of blebbing of capillary endothelium and alveolar epithelium, which is quite possibly indicative of cellular edema; also there can be observed highly-convoluted basement membrane, alveolar debris, and increased numbers of platelets.

**B75-10077****MOBILE AUTOMATIC METABOLIC ANALYZER**

G B Bynum and R J Currie

May 1975

**M-FS-23143**

Two flexible pipes, attached to face mask, are connected to spirometers in mobile cart. Inhaled air volume is measured as it is drawn from one spirometer, and exhaled air volume is measured as it is breathed into second spirometer. Sensor is used to monitor heartbeat rate.

**B75-10079****OXYGEN COCOON FOR PATIENTS UNDER INTENSIVE CARE**

W J Maas

May 1975

**MSC-12663**

Cocoon is made from Teflon film. It includes full-length pressure zipper on top side and bottom part is rigid pad constructed of burn-resistant material. Cocoon includes oxygen supply port with exhaust port at opposite end.

**B75-10083****REGULATOR FOR INTRAVENOUS FEEDING**

J Dimeff

May 1975

**ARC-10758**

Float valve maintains constant level of solution, providing constant drop rate as long as solution can flow into patient's

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vein. Second float valve allows solution to enter vein but prevents entry of air

### **B75-10148 HIP-JOINT SIMULATOR ACCURATELY DUPLICATES HUMAN WALKING PATTERN**

L B Johnson and A M Swikert  
Oct 1975

### **LEWIS-12515**

Device simulates all three motions of walking and provides realistic variable loading during each step. Simulator will enable laboratory evaluation of all known types of total hip prostheses

### **B75-10166 HIGHLY-VISIBLE AIR-SEA RESCUE MARKER**

I M Radnofsky and J Naimen

Aug 1975

### **MSC-12564**

Sea marker is made from sheets of polyolefin material. Material, attached to inflatable polyethylene tube, is coated with bright dye and is effective even in choppy water

### **B75-10167 MICROBIAL LOAD MONITOR**

W P Jones (McDonnell Aircraft Co) C Aldridge Jr (McDonnell Aircraft Co) T J Holen (McDonnell Aircraft Co) D R Vannest (McDonnell Aircraft Co) and F S Gibson

Aug 1975 See also NASA-CR-114922

### **MSC-14062**

Device can detect and identify a number of medically important microorganisms in an average of approximately 8 hours. Monitor consists of cartridges containing special selective media and solid state electro-optical detectors

### **B75-10168 DETERMINATION OF BONE MINERAL MASS IN VIVO**

R J Cameron (Wisconsin Univ) and F P Judy (Wisconsin Univ)

Aug 1975

### **MSC-14276**

Radiographic equipment incorporates two radiation sources generating high-energy and low-energy beams. Recording equipment measures amount of radiation that has penetrated limb. Data are fed into computer that determines mass of the examined bone

### **B75-10170 CONTINUOUS DETECTION OF VIABLE MICRO- ORGANISMS BY CHEMILUMINESCENCE**

S Witz (AMB Co) C Linnecke (AMB Co) and W Hartung (AMB Co)

Aug 1975

### **MSC-10170**

System monitors quality of reclaimed water continuously and automatically. Incubated samples are compared with unincubated ones by measuring their respective chemiluminescence

### **B75-10177 IMPLANTABLE PROSTHETIC PUMP BOOSTS BLOOD PRESSURE A CONCEPT**

W J Fish

Aug 1975

### **NPO-13626**

Prosthetic pump is proposed which can improve liver blood supply by boosting blood pressure locally to the organ. Device has potential use in treatment of cirrhosis of the liver

### **B75-10211 CATHETER-TIP FORCE TRANSDUCER FOR CAR- DIOVASCULAR RESEARCH**

C Feldstein W G Lewis H R Silver and H V Culler

Sep 1975

### **NPO-13643**

Sensor can be installed in left ventricle by means of procedures available for inserting catheter into an artery at body's extremities and manipulating it through vessel and past aortic valve. Metallic

tines of device can be used as internal electrode for electrocardiogram

### **B75-10253 RAPID METHOD FOR DETERMINATION OF ANTIMICROB- IAL SUSCEPTIBILITIES PATTERN OF URINARY BACTERIA**

L G Picciolo W L Chapelle, J M Barza (New England Medical Center) L Weinstein (New England Medical Center) A S Tuttle (New England Medical Center) and H Vellend (New England Medical Center)

Oct 1975

### **GSFC-12039**

Method determines bacterial sensitivity to antimicrobial agents by measuring level of adenosine triphosphate remaining in the bacteria. Light emitted during reaction of sample with a mixture of luciferase and luciferin is measured

### **B75-10269 ELECTROCARDIOGRAM SIGNAL ANALYZER**

M W Portnoy (Texas Technological Univ) H Dirilten (Texas Technological Univ) and E C Burton (Southwest Res Institute)

Oct 1975

### **MSC-12710**

Algorithm based on Taylor series expansion of Fourier transform has been developed and used for detection of cardiac arrhythmias in real-time electrocardiogram signal

### **B75-10303 LIGHTWEIGHT ORTHOTIC BRACES**

M R Baucom E H Johns, and C R Evans

Dec 1975

### **LANGLEY-11894**

Leg brace is constructed of fiber-reinforced polymer material. Composite material is stiffer, stronger and lighter than most metals

### **B75-10317 CONTROL OF NONENZYMATIC BROWNING IN INTERME- DIATE-MOISTURE FOODS**

A K Buckle (Minnesota Univ) P T Labuza (Minnesota Univ) and C H Warmbier (Minnesota Univ)

Dec 1975

### **MSC-14835**

Series of compounds called humectants were found to decrease rate of browning when added to intermediate-moisture foods. Twenty percent level of humectant can increase shelf life of foods by factor of 5 or 6

### **B75-10331 AUTOMATED MASS SPECTROMETER/ANALYSIS SYSTEM A CONCEPT**

G H Boettger E C Giffin J W Dreyer and A Kuppermann

Dec 1975

### **NPO-13572**

System performs rapid multiple analyses of entire compound classes or individual compounds on small amounts of sample and reagent. Method will allow screening of large populations for metabolic disorders and establishment of effective-but-safe levels of therapeutic drugs in body fluids and tissues

## 06 MECHANICS

### **B75-10003 LOW-COST, PORTABLE FIRE HOSE TESTER**

F P Jocke and E R Miller

Mar 1975

### **LEWIS-12365**

Availability of pumping unit permits scheduling and performing required periodic hose tests in proper manner while retaining



full fire equipment readiness Use of pumping unit preserves operating life and capability of pumper truck

**B75-10009**  
**DESIGN CRITERIA MONOGRAPH ON AXIAL FLOW TURBINES**

Apr 1975 See also NASA-SP-8110

**LEWIS-12376**

Monograph provides guidelines for predicting turbine performance sizing gas-path elements, and avoiding problems associated with mechanical design and development Material in monograph is organized along lines of design and development effort necessary to produce turbine that satisfies requirements imposed on it

**B75-10010**  
**DESIGN CRITERIA MONOGRAPH ON TURBOPUMP GEARS**

Apr 1975 See also NASA-SP-8100

**LEWIS-12377**

Turbopump power gears were brought to acceptable levels of usefulness and reliability through refinements in interdependent areas of design, materials processing, and quality control combined with extensive development testing that explored problem areas and evaluated potential solutions

**B75-10013**  
**DESIGN CRITERIA MONOGRAPH FOR METAL TANKS AND TANK COMPONENTS**

Apr 1975 See also NASA-SP-8088

**LEWIS-12434**

Significant elements in detail tank design are wall and end structures, weld joints at bulkhead and attachment junctures and ports and access openings Additional design considerations are influence and effect of fabrication processes on tank component design, and finally testing and inspection that are required to establish confidence in tank design

**B75-10022**  
**LONG LIFE, HIGH SPEED, THRUST-LOAD BALL BEARINGS**

H Signer (Ind Tectonics, Inc), N E Bamberger (GE), and V E Zaretsky

May 1975 See also NASA-TM-X-68264 NASA-TN-D-7837

**LEWIS-12269**

Long-term bearing operation at three million DN can be achieved with high degree of reliability using full combination of sophisticated but currently available state-of-the-art bearing materials and designs lubricants and lubricating techniques

**B75-10044**  
**HIGH-STRENGTH RIVET DOES NOT REQUIRE AGING**

F J Charles (Rockwell Intern Corp)

Apr 1975

**MSC-19301**

Aluminum rivet is simpler to handle It does not need aging and provides better high-temperature and shear properties than conventional rivets Tests at upset height of up to 1.7 diameters have shown rivets to have exceptionally good crack resistance

**B75-10052**  
**GAS BEARING OPERATES IN VACUUM**

S G Perkins

Apr 1975

**NPO-13425**

Bearing has restrictions to reduce air leaks and is connected to external pumpout facility which removes exhausted air Token amount of air which is lost to vacuum is easily removed by conventional vacuum pump

**B75-10055**  
**LOW-PROFILE LANDING-GEAR ASSEMBLY**

M P Harper (Boeing Co) and D F Neumann (Boeing Co)

Apr 1975

**ARC-10786**

Assembly of cylinders links actuators, and gears permits landing-gear unit to be retracted into shadow of main engine intake ducts of supersonic transport aircraft This is accomplished

without adding to frontal area of aircraft or appreciably increasing total aircraft drag

**B75-10058**  
**MOTOR-DRIVEN RACK-POSITIONING DEVICE**

E M Crissey (Martin Marietta Corp)

Apr 1975

**ARC-10864**

Ramped clutch plate prevents damage to gear train and provides ample linear motion for actuation of microswitch Operation of device is not affected by number of revolutions which pinion shaft must make to produce required translations Since ramps in spur gear are conical device will actuate identically at each mechanical stop

**B75-10063**  
**DESIGN CURVES FOR OPTIMIZING STABILITY OF HERRINGBONE-GROOVED JOURNAL BEARINGS**

P D Fleming and J B Hamrock

May 1973 See also NASA-TN-D-7803

**LEWIS-12442**

Curves span wide range of operating conditions including lubricant compressibility numbers from 0 to 80 bearing length-to-diameter ratios from 1/4 to 2 and either rotating or stationary grooved members

**B75-10064**  
**SCANNING-ELECTRON-MICROSCOPE USED IN REAL-TIME STUDY OF FRICTION AND WEAR**

A W Brainard and D H Buckley

Jun 1975 See also NASA-TN-D-7700

**LEWIS-12448**

Small friction and wear apparatus built directly into scanning-electron-microscope provides both dynamic observation and microscopic view of wear process Friction and wear tests conducted using this system have indicated that considerable information can readily be gained

**B75-10065**  
**DIFFUSION PUMP MODIFICATION PROMOTES SELF-CLEANSING AND HIGH EFFICIENCY**

A E Buggele

Jul 1975 See also NASA-TM-X-2932

**LEWIS-12323**

Modifications eliminate contaminant substances from pump fluid during operation which are principal causes of torpidity on evaporative surface Diffusion pump is also acting as still Resulting 100 percent vigorous working surface provides much greater molecular throughput and greatly improved efficiency

**B75-10074**  
**AIRFOIL DISPERSES SMOKESTACK EFFLUENTS UPWARD**

R C Costen

May 1975

**LANGLEY-11669**

System consists of negative-lift airfoil mounted at or near top of smokestack without obstructing flow of effluents from stack Controls adjust negative lift and drag of airfoil for changing orientation of airfoil to maintain proper airflow over foil and for adjusting its vertical location with respect to top of smokestack

**B75-10085**  
**TORQUE CONTROL SYSTEM**

D K Studenick A L Tyler and W Squillari

Jun 1975

**GSFC-11077**

System stabilizes azimuth of gondolas which are carried by high-altitude balloons as platforms for tracking telescopes When telescopes must be constantly aimed at specific targets control system stabilizes gondola to within 5 arc-seconds

**B75-10095**  
**SIMPLE AND EFFECTIVE METHOD TO LOCK BUOY POSITION TO OCEAN CURRENTS**

W A Vachon (Charles Stark Draper Lab Inc) and J M Dahlen

## 06 MECHANICS

(Charles Stark Draper Lab., Inc.)  
Jun 1975

### **M-FS-23140**

Window-shade drogue used with drifting buoys to keep them moving with current at speed as close to that of current as possible, has drag coefficient of 1.93 compared to maximum of 1.52 for previous drogues. It is remarkably simple to construct, use, and store.

### **B75-10110**

#### **CRYOGENIC LINE INSULATION MADE FROM PREFABRICATED POLYURETHANE SHELLS**

G. Lerma (Rockwell Intern. Corp.)  
Jun 1975

### **MSC-19523**

Prefabricated polyurethane foam insulation is inexpensive and easily installed on cryogenic lines. Insulation sections are semicircular half shells. Pair of half shells is placed to surround cryogenic line. Cylindrically-shaped knit sock is pulled over insulation, then covered with polyurethane resin to seal system.

### **B75-10111**

#### **POWERED FIRE NOZZLE FOR FAST PENETRATION OF STRUCTURES: A CONCEPT**

J. F. Parker (Rockwell Intern. Corp.) and R. L. Robbins (Rockwell Intern. Corp.)  
Jun 1975

### **MSC-19528**

Nozzle has been proposed with tip that will punch through wall very quickly. It would allow extinguishing agent to be delivered inside closed structure in minimum amount of time. Two versions of nozzle have been conceived: one operated from hydraulic pressure source and one activated by explosive charge.

### **B75-10131**

#### **MINIMIZATION OF JET AND CORE NOISE BY ROTATION OF FLOW**

I. R. Schwartz  
Jun 1975

### **ARC-10712**

Jet and core noise can be reduced and flame lengths may be significantly decreased when exhaust gases are caused to rotate or swirl about longitudinal axis of exhaust. Combustion in rotating flows is steady and quiet and is not accompanied by pulsations or violent fluctuations.

### **B75-10132**

#### **NEW DESIGN OF HINGELESS HELICOPTER ROTOR IMPROVES STABILITY**

R. A. Ormiston (USAA MRDL), W. G. Bousman (USAA MRDL), D. H. Hodges (USAA MRDL), and D. A. Peters (USAA MRDL)  
Jun 1975

### **ARC-10807**

Cantilever blades are attached directly to rotor hub, thereby substantially reducing cost and complexity and increasing reliability of helicopter rotor. Combination of structural flap-lag coupling and pitch-lag coupling provides damping of 6 to 10% depending on magnitude of coupling parameters.

### **B75-10134**

#### **SILICON NITRIDE USED AS A ROLLING-ELEMENT BEARING MATERIAL**

R. J. Parker and E. V. Zaretsky  
Jul 1975. See also NASA-TN-D-7794

### **LEWIS-12447**

Rolling-element fatigue tests were conducted with hot-pressed silicon nitride to determine its ability to withstand concentrated contacts in rolling-element bearings. If hot-pressed silicon nitride is used for both balls and races, attention must be paid to fitting both shaft and bearing housing.

### **B75-10135**

#### **DESIGN CRITERIA MONOGRAPH ON TURBOPUMP SYSTEMS**

Jul 1975. See also NASA-SP-8107

### **LEWIS-12499**

Turbopump assembly for modern liquid propellant rocket engine is complete system in itself. It consists of many components, some of which are themselves subsystems. Monograph deals with turbopump as system covering selection of proper system type for each application and integration of components into working system.

### **B75-10151**

#### **GRAPHITE FIBER-POLYIMIDE COMPOSITE ROD END BEARINGS FOR HIGH-TEMPERATURE HIGH-LOAD APPLICATIONS**

H. E. Sliney and T. P. Jacobson  
Oct 1975. See also NASA-TN-D-7880

### **LEWIS-12514**

Self-aligning plain spherical and plain cylindrical oscillating bearings with self-lubricating elements are composed of 50 weight-percent chopped graphite fibers and 50 weight-percent polyimide.

### **B75-10165**

#### **SOLAR RESIDENTIAL HEATING AND COOLING SYSTEM**

D. E. Melton and W. R. Humphries  
Aug 1975

### **M-FS-23260**

System has been placed in operation to verify technical feasibility of using solar energy to provide residential heating and cooling. Complete system analysis was performed, to provide design information.

### **B75-10173**

#### **LIGHTWEIGHT DUCTS FABRICATED FROM REINFORCED PLASTICS AND ELASTOMERS**

F. S. Dawn, T. J. Ballentine, R. E. Bishop (Rockwell Intern. Corp.), and C. R. Rousseau (Rockwell Intern. Corp.)  
Aug 1975

### **MSC-19482**

Method has been developed for fabrication of lightweight ducts that are three times stronger than aluminum ducts. Method can be used to produce either flexible or rigid ducts.

### **B75-10190**

#### **IMPROVED AIR ATOMIZING SPLASH-GROOVE FUEL INJECTOR REDUCES POLLUTANT EMISSIONS FROM TURBOJET ENGINES**

R. D. Ingebo and C. T. Norgren  
Oct 1975. See also NASA-TM-X-3255

### **LEWIS-12417**

Device produces finely atomized sprays which improve performance characteristics and reduce pollutant emissions of advanced high-pressure and high-temperature turbojet engines.

### **B75-10199**

#### **MARSHALL VEHICLE-ENGINEERING SIMULATION SYSTEM (MARVES)**

W. E. Keenum (Computer Sci. Corp.)  
Sep 1975

### **M-FS-21701**

Computer language was developed to furnish programmers with standardized system for handling digital computer simulation of trajectories. System contains collection of models which represent problem to be solved and description of one or more events peculiar to the problem.

### **B75-10201**

#### **ULTRASONIC DETECTION OF FLAWS IN LARGE STRUCTURAL AREAS**

F. E. Sugs (Rockwell Intern. Corp.) and C. C. Kammerer (Rockwell Intern. Corp.)  
Sep 1975

### **MSC-19499**

System's transducer consists of three piezoelectric elements that produce relatively-wide ultrasonic beam which covers significantly larger area and can monitor from a fixed point.

### **B75-10203**

#### **GAS GENERATORS PRODUCE HYDROGEN-RICH FUEL**

J Houseman R Kushida and J H Rupe

Sep 1975 See also 875-10208

**NPO-13342, NPO-13464**

Resulting fuel which is produced from gasoline and water can be burned by gasoline engines with significantly reduced pollution and improved fuel economy

**875-10208**

**HYDROGEN-RICH GAS GENERATORS TO REDUCE AIR POLLUTION AND IMPROVE GASOLINE ECONOMY**

J Houseman and D Cerini

Sep 1975 See also 875-10203

**NPO-13560, NPO-13561**

Thermal generator consisting of burner reaction chamber and heat exchanger produces gas from gasoline/air mixture Units can be utilized with spark ignition engine

**875-10209**

**LOW-COST SOLAR TRACKING SYSTEM**

C G Miller and J B Stephens

Sep 1975 See also 875-10210

**NPO-13579**

Smaller heat-collector is moved to stay in focus with the sun, instead of moving reflector Tracking can be controlled by storing data of predicted solar positions or by applying conventional sun-sensing devices to follow solar movement

**875-10214**

**APPARATUS FOR MEASURING STATIC COEFFICIENT OF FRICTION UNDER COMPRESSIVE LOADS**

C L Haehner and J L Tarpley

Oct 1975

**GSFC-11893**

Device includes load cell attached to rigid structure Crosshead directly beneath cell is connected to constant-speed electrical motor Crossarm supported by crosshead serves as platform on which bodies are tested Test data are recorded on X-Y recorder which is connected to load cell and motor

**875-10234**

**MULTIPLE-COMPARTMENT VENTING PROGRAM**

L P LeBlanc (Rockwell Intern Corp)

Oct 1975

**MSC-19428**

Computer program solves time-dependent energy and state equations for gas reservoirs using the solutions of conductor conservation equations as mass and energy rate changes to reservoirs

**875-10251**

**SINGLE RADIAL MAGNETIC BEARING A CONCEPT**

P A Studer

Oct 1975

**GSFC-11978**

Proposed bearing has increased stability Magnetic structure keeps inner and outer bearing halves aligned Electronic feedback circuit keeps bearing radially centered

**875-10258**

**REDUCING FLOW REQUIREMENTS OF FLUID ACTUATORS**

M J Long and S C Irick

Oct 1975

**LANGLEY-11540**

Method reduces volumetric rate of hydraulic fluid or air to drive actuator at high speed Method can be used with any positive displacement actuator with multiple chambers

**875-10259**

**TWO-DIRECTIONAL ACTIVE DAMPER**

C S Chang (New Technology, Inc)

Oct 1975 See also NASA-CR-132550

**LANGLEY-11815**

Damper system to be used in studies of payload isolation technology is suitable as a laboratory apparatus It provides easily adjustable damping and acts as multichannel shaker system

**875-10264**

**BRAKING ACTION OF WHEELED VEHICLES IS CONTROLLED AUTOMATICALLY DURING MINIMUM-DISTANCE STOPS**

D E Barthlome

Oct 1975 See also NASA-TM-X-72665

**LANGLEY-11897**

System prevents tire skid during panic stops Two mutually dependent accelerometers directly control solenoid valve which regulates braking pressure

**875-10270**

**SUSPENSION SYSTEM FOR LIGHTWEIGHT CRYOGENIC TANK**

J Lester (Beech Aircraft Corp) and D A Wendling (Beech Aircraft Corp)

Oct 1975

**MSC-14080**

System is composed of three interwoven fiberglass bands that encircle tank surface in basketweave configuration Fiberglass support is lightweight with low thermal conductivity

**875-10282**

**REMOVAL OF ICE AND MARINE GROWTH FROM SHIP SURFACES A CONCEPT**

A J Bauman

Oct 1975

**NPO-13658**

Proposed surface is structured from sections of low-melting-point alloy Sections are separated by network of passages for compressed air Ice or barnacles are removed by passing electrical current through alloy and bursts of compressed air through passages

**875-10284**

**IMPROVED AIRCRAFT REACTION NOZZLES**

J R Rogers

Nov 1975

**ARC-10906**

Reaction control nozzle requires low operating forces and has linear and predictable jet thrust vs nozzle exit area and position Nozzle thrust vector is controllable by single rotary motion

**875-10287**

**TURBINE DESIGN REVIEW TEXT**

Innovator not given Dec 1975 See also NASA SP-290 Vols

I II III

**LEWIS-12560**

Three-volume publication covers theoretical, design and performance aspects of turbines Volumes cover thermodynamic and fluid-dynamic concepts velocity diagram design turbine blade aerodynamic design turbine energy losses supersonic turbines radial-inflow turbines, turbine cooling and aerodynamic performance testing

**875-10298**

**STATIC AEROELASTIC PROGRAM**

J Roskam (Kansas Univ)

Dec 1975

**LANGLEY-11602**

Set of programs computes geometric mass aerodynamic and structural effects on fighter and transport type aircraft at subsonic and supersonic speeds

**875-10300**

**AMPLIFYING RIBBON EXTENSOMETER**

V L Alley Jr and A D McHatton

Dec 1975

**LANGLEY-11825**

Device provides accurate measurement of strain on flexible membranes and fabrics It is compact and lightweight, has strain-amplification capability up to five, and has an accuracy better than one percent

## 07 MACHINERY, EQUIPMENT AND TOOLS

**B75-10313**

### **COMPOUND HEAT PIPE OPERATES OVER BROAD TEMPERATURE RANGE**

H B McKee (McDouglas Douglas Corp)

Dec 1975

**M-FS-23329**

Device is combination of two or more heat pipes running adjacent to each other. Each pipe carries different working fluid in high-temperature pipe melts and begins to conduct heat.

## 07 MACHINERY, EQUIPMENT AND TOOLS

**B75-10011**

### **DESIGN CRITERIA MONOGRAPH ON TRANSMISSION SEALS**

S T Hayden (Sikorsky Aircraft) and C H Keller Jr (Sikorsky Aircraft)

Apr 1975 See also NASA-CR-120997

**LEWIS-12403**

Guide is based on experience obtained in wide variety of applications using lip circumferential and face seals. Particular attention is given to capabilities and lubrication of various seal types. Special limitations as a result of storage requirements, quality control, installation, operation, and removal are discussed.

**B75-10054**

### **LOW-COST TOOL SET FOR REMOVING BRAZED FITTINGS**

A Giandomenico

Apr 1975

**NPO-13495**

Set includes crimping tool and pull tube. Crimping tool is modified vise-grip pliers which has special jaws designed to crimp fittings. Pull tube has single thread on each end. Tube can be used once on each end before discarding.

**B75-10078**

### **FERROLUBRICANTS**

A F Whitaker

May 1975

**M-FS-23151**

Ferrolubricants have magnetized angstrom-size iron particles which stick oil to moving surfaces at all times, significantly reducing frictional wear. Magnetic fluids can be produced in families of various fluids having widely-varying chemical and physical properties.

**B75-10241**

### **SAFETY MANAGEMENT OF A COMPLEX R&D GROUND OPERATING SYSTEM**

J Connors and R A Mauer

Oct 1975 See also NASA-TM-X-71697

**LEWIS-12559**

Report discusses safety program implementation for large R&D operating system. Analytical techniques are defined and suggested as tools for identifying potential hazards and determining means to effectively control or eliminate hazards.

**B75-10249**

### **POSITION SENSING MATERIALS WOUND ON A REEL**

R M Muller

Oct 1975

**GSFC-11902**

Electro-optical counter measures number of layers of web wound on reel and indicates layer number and web position digitally without physically contacting reel or requiring numerical interpolation from mechanical readout device.

**B75-10276**

### **RELIABILITY COMPUTATION FROM RELIABILITY BLOCK DIAGRAMS**

P O Chelson and E Y Eckstein (VIP Engineering)

Oct 1975

**NPO-13304**

Computer program computes system reliability for very general class of reliability block diagrams. Four factors are considered in calculating probability of system success: active block redundancy, standby block redundancy, partial redundancy, and presence of equivalent blocks in the diagram.

**B75-10322**

### **FAST SEMIAUTOMATIC DIMENSIONAL TEST SET AND DATA LOGGER**

G E Meunier (Rockwell Intern Corp)

Dec 1975

**MSC-19554**

System measures and records tolerance deviations of thermal-protection ceramic tiles in less than 30 seconds. Accuracy of the machine is within 0.001 inch.

**B75-10334**

### **SIMPLIFIED HEAT ENGINE**

W H Higa

Dec 1975

**NPO-13613**

In Sterling-cycle heat engine, pneumatic system is used to drive displacer/regenerator, eliminating mechanical linkages and valves.

## 08 FABRICATION TECHNOLOGY

**B75-10006**

### **INHIBITING KIRKENDALL VOID GROWTH IN WELDED BIMETALLIC STRUCTURES**

F G Arcella (Westinghouse Astronuc Lab), G A Lessman (Westinghouse Astronuc Lab), and R A Lindberg

Mar 1975 See also NASA-CR-134490, NASA-CR-134526

**LEWIS-11573**

Technique employs pre-aged, void-free junction composed of parent materials. Basic process for Kirkendall void inhibition can be applied to thermionic power systems, high temperature seals, high temperature junctions between any two metals of differing melting points where Kirkendall void formation would be detrimental.

**B75-10089**

### **SPUTTERED GOLD MASK FOR DEEP CHEMICAL ETCHING OF SILICON**

B P Pisciotto, C Gross, and R S Olive

Jun 1975

**LANGLEY-11661**

Sputtered mask resists chemical attack from acid and has adherence to withstand prolonged submergence in etch solution without lifting from silicon surface. Even under prolonged etch conditions with significant undercutting, gold mask maintained excellent adhesion to silicon surface and imperviousness to acid.

**B75-10145**

### **MOUNTING TECHNIQUE FOR PRESSURE TRANSDUCERS MINIMIZES MEASUREMENT INTERFERENCES**

R N Lanham (Northrop Corp), C E Taylor (Northrop Corp), C E Balmer (Northrop Corp), and C Hwang (Northrop Corp)

Jul 1975

**ARC-10933**

Miniaturized transducers are fabricated from commercially available four-arm semiconductor gages. Transducers are connected as bridge circuit and mounted on internal face of small diaphragm. Jacket made of conductive plastic may be needed to avoid buildup or static charges.

**B75-10164****FABRICATION AND REPAIR OF GRAPHITE/EPOXY LAMINATES**

J R Lager (Martin Marietta Corp) and B Burke (Martin Marietta Corp)

Aug 1975

**M-FS-23228, M-FS-23229**

New forming and patching methods have been developed for high-quality graphite/epoxy laminates. Laminates range in thickness from 0.012 to 0.018 in (0.31 to 0.46 mm).

**B75-10179****THREE-DIMENSIONAL MODELS AID VISUALIZATION OF ENGINEERING DRAWINGS**

A R McDougal and C E Aardahl

Aug 1975

**NPO-13394**

Inexpensive cut-and-paste method allows construction of complex three-dimensional models in less than an hour. Models are constructed from film or paper copies made on office copier.

**B75-10212****IMPROVED CHEMICAL VAPOR-DEPOSITION REACTOR**

S S Chern and J Maserjian

Sep 1975

**NPO-13650**

Formation of large particles on substrate is eliminated by actively exhausting reacted gases. Effluent gas backflow is prevented by pumping in curtain of nitrogen above fresh reactive gases from several directions.

**B75-10216****MACHINE FOR FABRICATION OF BATTERY-ELECTRODE PLAQUES**

W C Harsch (Eagle-Picher Industries Inc)

Oct 1975

**GSFC-12004**

Functional parts of device are built to close tolerances of 0.001 inch (0.025 mm) and can be adjusted within range of plus or minus 0.005 inch (plus or minus 0.0127 mm).

**B75-10238****DIP MOLDING TO FORM INTRICATELY-SHAPED MEDICAL ELASTOMER DEVICES**

H F Broyles

Oct 1975

**NPO-13535**

Preshaped mandrel mounted on rotating mechanism is partially immersed in tank filled with liquid elastomer. While mandrel rotates elastomer film forms on mandrel surface due to surface tension and capillary behavior of liquid. Devices with well-defined flanges can be made using process.

**B75-10257****PROCESS FOR PREPARING POLYIMIDE ADHESIVES**

D J Progar, V L Bell, and T L St Clair (Virginia Polytechnic Institute and State Univ)

Oct 1975

**LANGLEY-11397**

High bonding strengths are obtained for metals and fiber-reinforced organic resin composites with no significant loss in thermo-oxidative stability of the adhesive resin.

**B75-10261****DIAMINE CURING AGENTS FOR POLYURETHANES**

V L Bell and T L St Clair (Virginia Polytechnic Institute and State Univ)

Oct 1975

**LANGLEY-11829**

Three aromatic diamines have properties that make them promising candidates as curing agents for converting isocyanates to polyurethanes with higher adhesive strengths, higher softening temperatures, better toughness, and improved abrasion resistance.

**B75-10267****INDUSTRIAL LASER WELDING: AN EVALUATION**

R Hella (Avco Everett Res Lab), E Locke (Avco Everett Res Lab) and S Ream (Avco Everett Res Lab)

Oct 1975

**M-FS-23237**

Report describes 10-kW laser welding system designed to weld large structures made from 1/4-inch and 1/2-inch aluminum (2219) and D6AC steel.

**B75-10299****FORMATION OF INTERNALLY-CONFINED SEMICONDUCTOR LASERS**

V M Cannuli (RCA)

Dec 1975

**LANGLEY-11770**

In technique for fabrication of strip lasers, current constrictions are accomplished by diffusing blocking regions into n-type substrate prior to growth. Current flow is controlled by blocking layers which results in reduction of threshold current and better heat dissipation.

**B75-10301****LOW-COST HOT-AIR SOLAR COLLECTOR**

E P Herndon and K G Anthony

Dec 1975

**M-FS-23272**

System has only three components per cell. Cell parts are fabricated from readily available materials and following a construction procedure which requires use of only simple handtools, can be mounted in place by one person.

**B75-10309****FOAM-MACHINING TOOL WITH EDDY-CURRENT TRANSDUCER**

W P Copper (Martin Marietta Corp)

Dec 1975

**M-FS-23298**

Three-cutter machining system for foam-covered tanks incorporates eddy-current sensor. Sensor feeds signal to numerical controller which programs rotational and vertical axes of sensor travel, enabling cutterhead to profile around tank protrusions.

**B75-10319****BIAXIAL COMPRESSION TEST TECHNIQUE**

E T Hansard (Gen Dyn Corp)

Dec 1975

**MSC-14883**

Fixture and technique have been developed for predicting behavior of stiffened skin panels under biaxial compressive loading. Tester can load test panel independently in longitudinal and transverse directions. Data can also be obtained in combined mode.

## 09 COMPUTER PROGRAMS

**B75-10002****COMPUTER PROGRAM FOR THERMODYNAMIC ANALYSIS OF OPEN-CYCLE MULTISHAFT POWER SYSTEM**

A J Glassman

Mar 1975

**LEWIS-12324**

Program computes specific power output, specific fuel consumption, and cycle efficiency for power systems having any number of shafts up to maximum of five. Maximum temperatures should be no higher than about 2000 K (3140 F) because molecular dissociation is not included in stoichiometry.

**B75-10005****COMPUTER PROGRAM TO GENERATE ENGINE INLET**

## 09 COMPUTER PROGRAMS

### FLOW CONTOUR MAPS AND DISTORTION PARAMETERS

J H Dicus

Mar 1975

**LEWIS-12247**

Program generates inlet contour maps with choice of mapping parameters. Contour maps are represented by symbols on picture produced by line printer. Program also generates variety of simple circumferential and radial distortion parameters that enable calculation of almost any specific distortion parameter.

**B75-10015**

### REGENERATIVE COOLING DESIGN AND ANALYSIS COMPUTER PROGRAM

J G Gerstley (Rockwell Intern Corp) and R D Tobin (Rockwell Intern Corp)

Apr 1975

**LEWIS-12110**

Program evaluates influences of heat transfer, stress and cycle life. Coolant passages may be tubes or channels with or without gas-side wall coating. Program options include two-dimensional thermal analysis model of tube or channel cross-section using relaxation technique with variable number of nodes.

**B75-10018**

### COMPUTER PROGRAMS FOR CALCULATING POTENTIAL FLOW IN PROPULSION SYSTEM INLETS

N O Stockman and S L Button

Apr 1975

**LEWIS-12152**

Calculational procedure evolved in process of designing inlets. Douglas axisymmetric potential flow program called EOD calculates incompressible potential flow about arbitrary bodies. Program SCIRCL generates input for EOD from inlet components. Program COMBYN takes basic solutions output by EOD and combines them into solutions of interest and applied compressibility correction.

**B75-10019**

### COMPUTER PROGRAMS FOR HANDLING PROPULSION SYSTEM NOISE DATA

F J Montegani

Apr 1975

**LEWIS-12285**

Computer programs have been developed for efficient handling of one-third-octave band noise data originating from outdoor full-scale fan noise facility and engine acoustic facility at Lewis Research Center.

**B75-10020**

### COMPRESSIBLE FLOW COMPUTER PROGRAM FOR GAS FILM SEALS

J Zuk and P J Smith

Apr 1975

**LEWIS-12286**

Computer program, AREAX calculates properties of compressible fluid flow with friction and area change. Program carries out quasi-one-dimensional flow analysis which is valid for laminar and turbulent flows under both subsonic and choked flow conditions. Program was written to be applied to gas film seals.

**B75-10021**

### COMPUTER PROGRAM FOR DEFINITION OF TRANSONIC AXIAL-FLOW COMPRESSOR BLADE ROWS

J E Crouse

Apr 1975

**LEWIS-12325**

Particular type of blade element used has two segments which have centerlines and surfaces described by constant change of angle with path distance on cone. Program is result of rework of earlier program to give major gains in accuracy, reliability and speed. It also covers more steps of overall compressor design procedure.

**B75-10029**

### ANALYTIC MODEL FOR ASSESSING THERMAL PERFORMANCE OF SCUBA DIVERS

L D Montgomery

Feb 1975

**ARC-10927**

To assist design of adequate protective clothing, mathematical model of man's thermoregulatory system has been developed so that body thermal responses under immersed conditions can be predicted accurately. Experimental data encompassed wide range of water temperatures, protective clothing, breathing-gas mixtures, and durations of immersion.

**B75-10032**

### VIEW FACTOR COMPUTER PROGRAM (VIEW)

C E Jackson, Jr and E F Puccinelli

Apr 1975

**GSFC-11910**

Existing view factor program RAVFAC was modified to accept NASTRAN and/or RAVFAC surface descriptions. Output formatting was altered to produce view factor matrices which could be directly input to NASTRAN.

**B75-10033**

### EXTENSIVE SET OF MACROS FOR STRUCTURED PROGRAMMING IN OS/360 ASSEMBLY LANGUAGE (STRCMACS)

C W Barth

Apr 1975

**GSFC-11938**

Development of consistent assembly language structured programming techniques has been enhanced by use of assembly macros developed for structured programming. Set of macros was written for IBM OS/360 Assembly language.

**B75-10053**

### JPL TRANSIENT RADIATION ANALYSIS BY COMPUTER PROGRAM (JTRAC)

S Weinstein

Apr 1975

**NPO-13470**

Digital computer program JTRAC simulates time response of electronic circuit to arbitrary forcing functions which may include electrical and/or radiation stimuli. Program is designed to solve linear and nonlinear simultaneous equations which characterize mathematical models used to predict circuit response for electrical and/or radiation input.

**B75-10060**

### PREDICTION OF AIRCRAFT NOISE SOURCE AND ESTIMATION OF NOISE-LEVEL CONTOURS

N A Peart (Boeing Co)

Apr 1975

**ARC-10880**

Two computer programs aid aircraft designers who need to identify noise characteristics of various aircraft and engine configurations. Calculated noise levels can then be compared with community goals for noise limitation.

**B75-10093**

### FOUR-DIMENSIONAL WORLDWIDE ATMOSPHERIC MODELS ANYPT AND ANYRG

D Johnson, C Brown, D Spiegler (Environ Res and Technol) and M Fowler (Environ Res and Technol)

Jun 1975

**M-FS-22838**

Computer programs read magnetic-tape data bases and computer meteorological profiles for any position, time and height (from zero to 25 km). System assists in analyses of distortion of information obtained from aircraft-mounted or spacecraft-mounted electromagnetic sensors.

**B75-10094**

### COMPUTER PROGRAM FOR NUMERICAL ANALYSIS OF STIFFENED SHELLS OF REVOLUTION

J Key and V Valbonas (Grumman Aerospace Co)

Jun 1975

**M-FS-23027**

Programs using Love-Reissner first-order shell theory can analyze orthotropic thin shells of revolution subjected to

unsymmetric distributed loading or concentrated line loads and thermal strains. They can perform stability or vibration analysis of thin shells of revolution subjected to axisymmetric distributed loading or concentrated line loads and thermal strains.

**B75-10100**  
**PROGRAM FOR ANALYSIS OF NONLINEAR EQUILIBRIUM AND STABILITY (PANES)**

R G Vos (Boeing Co)

Jun 1975

**M-FS-23172**

PANES utilizes improved techniques for analysis of structures with material and geometric nonlinearities including limit point and bifurcations behavior which occurs in buckling and collapse problems. Incremental loading, Newton-Raphson iteration, and higher order methods are used in program.

**B75-10106**  
**COMPUTER PROGRAM FOR ANALYSIS OF VECTORCAR-DIOGRAMS (VECTAN II)**

G W Hoffer, D P Golden (Technol Inc) and R A Wolthuis (Technol Inc)

Jun 1975

**MSC-14386**

VECTAN II accepts as input digitized three-lead VCG data sampled at 320 samples/second/lead, analyzing one VCG complex in each 5-second interval for experiments of up to 25 minutes duration. Program calibrates these data, locates major waveforms, performs waveform analyses, and produces statistical summary of analyzed data.

**B75-10130**  
**COMPUTER MODELING OF ARC DRIVERS**

R E Dannenberg and P I Slapnicar (Stanford Univ)

Jun 1975

**ARC-10955**

Model is generated from description of element connections involved in complete arc network, list of corresponding circuit element values, description of circuit current excitation, and list of out-puts desired. Waveform of current is determined by structure of capacitor storage system, driver geometry, and preset driver conditions.

**B75-10133**  
**MULTIPLEXING TECHNIQUE FOR COMPUTER COMMUNICATIONS VIA SATELLITE CHANNELS**

R Binder (Hawaii Univ)

Jun 1975

**ARC-10879**

Multiplexing scheme combines technique of dynamic allocation with conventional time-division multiplexing. Scheme is designed to expedite short-duration interactive or priority traffic and to delay large data transfers. As result, each node has effective capacity of almost total channel capacity when other nodes have light traffic loads.

**B75-10140**  
**METHOD OF IDENTIFYING CLUSTERS REPRESENTING STATISTICAL DEPENDENCIES IN MULTIVARIATE DATA**

W J Borucki, D H Card, and G C Lyle

Jul 1975

**ARC-10744**

Approach is first to cluster and then to compute spatial boundaries for resulting clusters. Next step is to compute from set of Monte Carlo samples obtained from scrambled data estimates of probabilities of obtaining at least as many points within boundaries as were actually observed in original data.

**B75-10143**  
**ALGORITHM FOR NONLINEAR STATIONARY NAVIER-STOKES PROBLEM**

R E Gabrielsen and S Karel

Jul 1975

**ARC-10960**

Results of applications of algorithm suggest that it has potential application to variety of related fluid flow problems.

such as presently intractable separation problem of aerodynamics. Details of mathematical development, as well as computation of explicit error estimates, are available.

**B75-10146**  
**SIMPLE COMPUTER METHOD PROVIDES CONTOURS FOR RADIOLOGICAL IMAGES**

J D Newell (California Univ, San Diego), R A Keller (California Univ, San Diego), and N A Baily (California Univ, San Diego)

Jul 1975

**ARC-10940**

Computer is provided with information concerning boundaries in total image. Gradient of each point in digitized image is calculated with aid of threshold technique. Then there is invoked set of algorithms designed to reduce number of gradient elements and to retain only major ones for definition of contour.

**B75-10155**  
**REMOTE FILE INQUIRY (RFI) SYSTEM**

Innovator not given (IBM) Aug 1975

**KSC-10837**

System interrogates and maintains user-definable data files from remote terminals using English-like free-form query language easily learned by persons not proficient in computer programming. System operates in asynchronous mode, allowing any number of inquiries within limitation of available core to be active concurrently.

**B75-10172**  
**TRIMETRIC SCALE FOR DRAFTING MACHINES**

J C Ryan (Rockwell Intern Corp) and R Chu (Rockwell Intern Corp)

Aug 1975

**MSC-15829, JSC-19391**

Device allows three basic projections to be drawn from a single scale zero setting. Ellipse proportions are included for convenience. Axonometric projections can also be determined.

**B75-10186**  
**RETSCP-A COMPUTER PROGRAM FOR ANALYSIS OF ROCKET ENGINE THERMAL STRAINS WITH CYCLIC PLASTICITY**

R W Miller (Atkins and Merrill Inc)

Oct 1975

**LEWIS-12388**

Finite element program employs three-dimensional isoparametric element for analysis of rocket engine thermal strains with cyclic plasticity.

**B75-10187**  
**COMPUTER PROGRAM FOR CALCULATING WATER AND STEAM PROPERTIES**

R C Hendricks, I C Peller, and A K Baron

Nov 1975

**LEWIS-12519**

Computer subprogram calculates thermodynamic and transport properties of water and steam. Program accepts any two of pressure, temperature, and density as input conditions. Pressure and either entropy or enthalpy are also allowable input variables. Output includes any combination of temperature, density, pressure, entropy, enthalpy, specific heats, sonic velocity, viscosity, thermal conductivity, surface tension, and the Laplace constant.

**B75-10188**  
**COMPUTER PROGRAM FOR CALCULATING THERMODYNAMIC AND TRANSPORT PROPERTIES OF FLUIDS**

R C Hendricks, A K Braon, and I C Peller

Oct 1975

**LEWIS-12520**

Computer code has been developed to provide thermodynamic and transport properties of liquid argon, carbon dioxide, carbon monoxide, fluorine, helium, methane, neon, nitrogen, oxygen, and parahydrogen. Equation of state and transport coefficients are updated and other fluids added as new material becomes available.

## 09 COMPUTER PROGRAMS

**B75-10194**

**EXECUTIVE COMPUTER PROGRAM FOR LINKING INDEPENDENT COMPUTER PROGRAMS ODINEX**

C R Latt (Aerophysics Res Corp), D S Hague (Aerophysics Res Corp) and D A Watson (Aerophysics Res Corp)  
Sep 1975

**LANGLEY-11324**

Program controls sequence of execution of network of program elements and maintains data base of common information which forms communication link among them Approach is applicable to any multiple-program task

**B75-10242**

**COMPUTER PROGRAM FOR THE ATTENUATION OF HIGH BYPASS TURBOFAN ENGINE NOISE**

H F Veldman (Boeing Co)  
Oct 1975

**LEWIS-12179**

Two computer programs determine effect of boundary layer on attenuation of sound in a circular duct lined with material used in noise suppression in fan inlet and exhaust ducts of turbofan engines

**B75-10243**

**IMPROVED AXISYMMETRIC POTENTIAL FLOW COMPUTER PROGRAM**

J L Hess (McDonnell Douglas Corp)  
Oct 1975

**LEWIS-12387**

Basic method of calculating potential flow has been refined to increase accuracy of results and to reduce computational time Program calculates low speed flows about or within bodies of axially symmetric shape Solid body, inlet, and purely internal flow problems can be solved

**B75-10252**

**COMPUTER INTEGRATION OF HYDRODYNAMICS EQUATIONS FOR HEAT PIPES**

D K Edwards (TRW Systems Group), J E Eninger (TRW Systems Group) and B D Marcus (TRW Systems Group)  
Oct 1975

**GSFC-12009**

Program has five operational modes that provide user flexibility in answering crucial heat-pipe design questions User specifies heat input and rejection distribution

**B75-10263**

**IMPROVED GENERAL-PURPOSE NAMELIST PROCESSOR**

E W Wojtaszek (Martin Marietta Corp)  
Oct 1975

**LANGLEY-11834**

Processor is written in FORTRAN with minimal machine-dependent coding allowing easy conversion to various digital computers It eliminates 19 continuation-card limit of current namelist processors and permits unlimited number of variables to be read in a single namelist declaration

**B75-10273**

**A STUDY OF ACCURACY IN SELECTED NUMERICAL-ANALYSIS INTEGRATION TECHNIQUES**

W M Lear (TRW, Inc)  
Oct 1975 See also NASA-CR-141784

**MSC-14802**

Report discusses several methods of performing numerical integration with computer When data can be expressed as state vector that is dependent variable in a differential equation self-starting integrators can be used to predict future data

**B75-10278**

**GENERATION OF KEY IN CRYPTOGRAPHIC SYSTEM FOR SECURE COMMUNICATIONS**

M Perlman  
Oct 1975  
**NPO-13451**

Report discusses key generation for transmission of confidential data A number of feedback functions are discussed for generation of long key sequences

**B75-10292**

**COMPUTER SYSTEM FOR LIBRARY ACCESS**

A DelFrate  
Dec 1975

**GSFC-11952**

Program performs traditional file creation maintenance, and output MARC II compatible data records can be added changed or deleted in bibliographic file

**B75-10294**

**GENERAL OPTICS EVALUATION PROGRAM (GENOPTICS)**

B J Howell  
Dec 1975

**GSFC-12038**

Program prints and plots results of computations such as ray traces radial energy distributions, and designs of two-mirror telescopes

**B75-10295**

**SMALL INTERACTIVE IMAGE PROCESSING SYSTEM (SMIPS)**

J G Moik (Computer Sci Corp)  
Dec 1975

**GSFC-12079**

System facilitates acquisition digital processing and recording of image data as well as pattern recognition in an iterative mode

**B75-10302**

**THE LANGLEY RESEARCH CENTER NASA/PERT TIME III**

Innovator not given (Project Schedules and Analysis Group) Dec 1975

**LANGLEY-11887**

Program provides practical system for total project management in areas of planning scheduling resource control, and reporting It allows use of existing management and administrative tools and processes and is applicable to many types of projects

**B75-10318**

**POWER SPECTRUM ANALYSIS OF STAGGERED QUADRIPHASE-SHIFT-KEYED SIGNALS**

F L McWhorter (Magnavox Co) and D E Cartier (Magnavox Co)  
Dec 1975

**MSC-14865**

Mathematical analysis of power spectrum of outputs from high-reliability communication system is used to determine system bandwidth Analysis provides mathematical relationships of signal power spectrum at output of hard limiter for any type of baseband pulse input subjected only to output parameter constraints

**B75-10338**

**MINIMIZATION SEARCH METHOD FOR DATA INVERSION**

A L Fymat  
Dec 1975 See also B75-10335  
**NPO-99999**

Technique has been developed for determining values of selected subsets of independent variables in mathematical formulations Required computation time increases with first power of the number of variables This is in contrast with classical minimization methods for which computational time increases with third power of the number of variables



# SUBJECT INDEX

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Issue 16

### Subject Index

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GSFC-12039 B75-10253 05

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GSFC-11895 B75-10248 03

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ARC-10880 B75-10060 09  
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ARC-10925 B75-10028 03  
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ARC-10960 B75-10143 09  
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NPO-13606 B75-10333 03  
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ARC-10880 B75-10060 09

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MSC-12564 B75-10166 05

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LANGLEY-11833 B75-10227 03

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LANGLEY-11771 B75-10224 03

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LANGLEY-11351 B75-10256 03

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ARC-10744 B75-10140 09

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NPO-13110 B75-10175 02

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MSC-14866 B75-10236 03

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MSC-12710 B75-10269 05

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ARC-10879 B75-10133 09

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High-power ac/dc variable load simulator

MSC-14788 B75-10108 02

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M-FS-23237 B75-10267 08

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High-strength rivet does not require aging

MSC-19301 B75-10044 06

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Antiresonant ring interferometer for laser cavity dumping mode locking, and other applications

HQ-10844 B75-10087 03

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**ANALOG TO DIGITAL CONVERTERS**

Computer program for analysis of vectorcardiograms (VECTAN II)

MSC-14386 B75-10106 09

A hybrid general-purpose bit synchronizer

MSC-14330 B75-10169 02

Position sensing materials wound on a reel

GSFC-11902 B75-10249 07

Highly stable analog-to-digital converter

NPO-13385 B75-10277 01

Delay-lock-loop code-correlation synchronizer

GSFC-11868 B75-10291 02

**ANALYSIS (MATHEMATICS)**

Optical design computer program LENS II

GSFC-11951 B75-10250 03

Computer integration of hydrodynamics equations for heat pipes

GSFC-12009 B75-10252 09

Electrocardiogram signal analyzer

MSC-12710 B75-10269 05

A study of accuracy in selected numerical-analysis integration techniques

MSC-14802 B75-10273 09

General optics evaluation program (GENOPTICS)

GSFC-12038 B75-10294 09

Static aeroelastic program

LANGLEY-11602 B75-10298 06

Power spectrum analysis of staggered quadruphase-shift-keyed signals

MSC-14865 B75-10318 09

Minimization search method for data inversion

NPO-99999 B75-10338 09

**ANCHORS (FASTENERS)**

Suspension system for lightweight cryogenic tank

MSC-14080 B75-10270 06

**ANGULAR RESOLUTION**

Angular device for optical filters

LANGLEY-11796 B75-10158 03

**ANIONS**

Covalent bonding of polycations to small polymeric particles

NPO-13487 B75-10327 04

**ANISOTROPIC MEDIA**

Improved ion exchange membrane

NPO-13309 B75-10117 04

Ellipsometer measurements of epitaxial GaAs layers A concept

M-FS-23238 B75-10230 01

**ANNEALING**

Fabrication of porous plugs for control of liquid helium

M-FS-23218 B75-10163 04

**ANTENNA DESIGN**

Highly-efficient horn/reflector antenna

NPO-13568 B75-10330 01

**ANTENNA FEEDS**

Multibeam-antenna feed system to isolate orthogonally polarized beams

NPO-13140 B75-10046 02

High-efficiency K-band tracking antenna feed

MSC-14717 B75-10107 02

Variable-beamwidth antenna without moving parts

GSFC-11924 B75-10215 02

**ANTENNA RADIATION PATTERNS**

Variable-beamwidth antenna without moving parts

GSFC-11924 B75-10215 02

**ANTIBIOTICS**

Rapid method for determination of antimicrobial susceptibilities pattern of urinary bacteria

GSFC-12039 B75-10253 05

**ANTINODES**

Levitation of objects using acoustic energy

M-FS-23261 B75-10232 03

**ANTISKID DEVICES**

Braking action of wheeled vehicles is controlled automatically during minimum-distance stops

LANGLEY-11897 B75-10264 06

**APPLICATIONS OF MATHEMATICS**

Minimization search method for data inversion

NPO-99999 B75-10338 09

**ARC GENERATORS**

Computer modeling of arc drivers

ARC-10955 B75-10130 09

**ARC LAMPS**

Uniform high irradiance source

LEWIS-12360 B75-10008 03

Ultraviolet hydrogen-discharge lamp

MSC-14793 B75-10272 03

**ARCHITECTURE**

Solar residential heating and cooling system

M-FS-23260 B75-10165 06

Solar power roof shingle

LEWIS-12587 B75-10289 01

Low-cost hot-air solar collector

M-FS-23272 B75-10301 08

**ASBESTOS**

Reconstituted asbestos matrix for fuel cells

MSC-12568 B75-10339 04

**ASSEMBLER ROUTINES**

Improved general-purpose namelist processor  
 LANGLEY-11834 B75-10263 09

**ASSEMBLING**

Process for preparing polyimide adhesives  
 LANGLEY-11397 B75-10257 08

**ASSEMBLY LANGUAGE**

Extensive set of macros for structured programming in OS/360 assembly language (STRCMACS)  
 GSFC-11938 B75-10033 09

Remote file inquiry (RFI) system  
 KSC-10837 B75-10155 09

**ATMOSPHERIC DENSITY**

Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
 M-FS-22838 B75-10093 09

**ATMOSPHERIC ELECTRICITY**

Time-of-arrival lightning activity location system  
 KSC-11006 B75-10297 02

**ATMOSPHERIC MODELS**

Handbook for estimating toxic fuel hazards  
 M-FS-21114 B75-10198 04

**ATMOSPHERIC MOISTURE**

Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
 M-FS-22838 B75-10093 09

**ATMOSPHERIC TEMPERATURE**

Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
 M-FS-22838 B75-10093 09

**ATOMIC CLOCKS**

Quasars as very-accurate clock synchronizers  
 NPO-13276 B75-10114 02

**ATTITUDE CONTROL**

Gas bearing operates in vacuum  
 NPO-13425 B75-10052 06  
 Improved aircraft reaction nozzles  
 ARC-10906 B75-10284 06

**AUDIO EQUIPMENT**

Portable headset microphone checker  
 KSC-10699 B75-10254 02

**AUTOMOBILE ENGINES**

Steam automobile analysis  
 M-FS-23188 B75-10229 03

**AUTOMOBILES**

Steam automobile analysis  
 M-FS-23188 B75-10229 03  
 Braking action of wheeled vehicles is controlled automatically during minimum-distance stops  
 LANGLEY-11897 B75-10264 06

**AVALANCHE DIODES**

Zener-regulated solar array/battery power system  
 M-FS-23195 B75-10162 02

**AXIAL COMPRESSION LOADS**

Biaxial compression test technique  
 MSC-14883 B75-10319 08

**AXIAL FLOW TURBINES**

Computer program for definition of transonic axial-flow compressor blade rows  
 LEWIS-12325 B75-10021 09  
 Turbine design review text  
 LEWIS-12560 B75-10287 06

**B****BACTERIA**

Rapid method for determination of antimicrobial susceptibilities pattern of urinary bacteria  
 GSFC-12039 B75-10253 05

**BALL BEARINGS**

Long life high speed thrust-load ball bearings  
 LEWIS-12269 B75-10022 06

**BALLAST (MASS)**

Simple and effective method to lock buoy position to ocean currents  
 M-FS-23140 B75-10095 06

**BALLASTS (IMPEDANCES)**

Uniform high irradiance source  
 LEWIS-12360 B75-10008 03

**BALLOONS**

Amplifying ribbon extensometer  
 LANGLEY-11825 B75-10300 06

**BANDWIDTH**

Power spectrum analysis of staggered quadruphase-shift-keyed signals  
 MSC-14865 B75-10318 09

**BARRIER LAYERS**

Inhibiting Kirkendall void growth in welded bimetallic structures  
 LEWIS-11573 B75-10006 08

**BATHS**

Dichromated-gelatin hologram process for improved optical quality  
 M-FS-23170 B75-10099 03

**BEAM SPLITTERS**

Visual alignment aid  
 LANGLEY-11842 B75-10228 03  
 Signal mixer for optical heterodyne receiver  
 M-FS-23251 B75-10307 03

**BEAM WAVEGUIDES**

Diffused guides for distributed-feedback lasers  
 NPO-13544 B75-10206 03  
 Collimation of electron and X-ray beams using zeolite crystals  
 NPO-13557 B75-10329 03

**BEARING ALLOYS**

Long life, high speed, thrust-load ball bearings  
 LEWIS-12269 B75-10022 06

**BEARINGS**

Torque control system  
 GSFC-11077 B75-10085 06  
 Graphite fiber/polyimide composite rod end bearings for high-temperature high-load applications  
 LEWIS-12514 B75-10151 06  
 Single radial magnetic bearing A concept  
 GSFC-11978 B75-10251 06

**BENDING**

New design of hingeless helicopter rotor improves stability  
 ARC-10807 B75-10132 06

**BIAS**

Variable-gap bias structure for magnetic bubble memory package  
 LANGLEY-11765 B75-10221 01

**BIBLIOGRAPHIES**

Wind energy utilization A bibliography  
 LEWIS-12518 B75-10136 02  
 Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
 LEWIS-12502 B75-10138 03

Fracture toughness testing data A technology survey and bibliography  
 LEWIS-12503 B75-10139 03

**BINARY DATA**

Synchronizer for random binary data  
 NPO-13286 B75-10325 02

**BIOASSAY**

Automated mass spectrometer/analysis system A concept  
 NPO-13572 B75-10331 05

**BIOENGINEERING**

Hip-joint simulator accurately duplicates human walking pattern  
 LEWIS-12515 B75-10148 05  
 Lightweight orthotic braces  
 LANGLEY-11894 B75-10303 05

**BIOINSTRUMENTATION**

Portable automatic blood analyzer  
 MSC-14627 B75-10041 05  
 Subminiature transducers for measuring forces and deformation of heart muscle  
 NPO-13423 B75-10051 05  
 Hand tremor and activity sensor  
 ARC-10849 B75-10057 05  
 Catheter-tip force transducer for cardiovascular research  
 NPO-13643 B75-10211 05  
 Dip molding to form intricately-shaped medical elastomer devices  
 NPO-13535 B75-10238 08

**BIOMEDICAL DATA**

Data processing large quantities of multispectral information  
 MSC-14472 B75-10080 03

**BIOTECHNOLOGY**

New urea-absorbing polymers for artificial kidney machines  
 NPO-13620 B75-10336 04

**BIREFRINGENCE**

Wide-field birefringent elements  
 MSC-12677 B75-10105 03

**BISMUTH TELLURIDES**

Thermoelectrically-cooled quartz microbalance  
 M-FS-23101 B75-10076 04

**BIT SYNCHRONIZATION**

A hybrid general-purpose bit synchronizer  
 MSC-14330 B75-10169 02

**BLOOD**

Portable automatic blood analyzer  
 MSC-14627 B75-10041 05  
 Covalent bonding of polycations to small polymeric particles  
 NPO-13487 B75-10327 04

**BLOOD PRESSURE**

Implantable prosthetic pump boosts blood pressure A concept  
 NPO-13626 B75-10177 05

**BOATS**

Simple and effective method to lock buoy position to ocean currents  
 M-FS-23140 B75-10095 06  
 Highly-visible air-sea rescue marker  
 MSC-12564 B75-10166 05  
 Removal of ice and marine growth from ship surfaces A concept  
 NPO-13658 B75-10282 06

**BODIES OF REVOLUTION**

Computer program for numerical analysis of stiffened shells of revolution  
 M-FS-23027 B75-10094 09

**BODY FLUIDS**

Improved extraction technique for biological fluids  
 NPO-13084 B75-10045 05

Automated mass spectrometer/analysis system A concept  
NPO-13572 B75-10331 05

**BONDING**  
Process for preparing polyimide adhesives  
LANGLEY-11397 B75-10257 08  
Low-Cost thin-layer silicon solar cells  
GSFC-12023 B75-10293 04  
Quality control of microelectronic wire bonds  
M-FS-23327 B75-10312 01

**BONES**  
Determination of bone mineral mass in vivo  
MSC-14276 B75-10168 05

**BORON NITRIDES**  
Compact laser through improved heat conductance  
NPO-13147 B75-10176 03

**BOUNDARY LAYER FLOW**  
Laser velocimeter measurements of high-speed compressible flows  
ARC-10781 B75-10141 03

**BOUNDARY LAYERS**  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 B75-10242 09

**BRAGG ANGLE**  
High-energy lasers by using distributed reflection A concept  
NPO-13346 B75-10118 03

**BRAKES (FOR ARRESTING MOTION)**  
Braking action of wheeled vehicles is controlled automatically during minimum-distance stops  
LANGLEY-11897 B75-10264 06

**BRAZING**  
Low-cost tool set for removing brazed fittings  
NPO-13495 B75-10054 07

**BREATHING APPARATUS**  
Mobile automatic metabolic analyzer  
M-FS-23143 B75-10077 05  
Oxygen cocoon for patients under intensive care  
MSC-12663 B75-10079 05

**BROADBAND**  
Dual-band ridged waveguide  
LANGLEY-11781 B75-10091 01  
New broadband square-law detector  
NPO-13410 B75-10180 02

**BROADBAND AMPLIFIERS**  
Reflected-wave maser  
NPO-13490 B75-10279 03

**BROMINE**  
Acid/alkali bromide secondary battery  
NPO-13237 B75-10324 01

**BUBBLES**  
Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 B75-10195 01  
Low-loss stripe-line coil for magnetic bubble memory  
LANGLEY-11707 B75-10196 01  
Bubble-domain circuit wafer evaluation coil set  
LANGLEY-11728 B75-10197 01

**BUCKLING**  
Program for analysis of nonlinear equilibrium and stability (PANES)  
M-FS-23172 B75-10100 09

**BUFFER STORAGE**  
Buffer control unit for computer communications  
ARC-10870 B75-10059 02

**BUILDINGS**

Solar power roof shingle  
LEWIS-12587 B75-10289 01  
Low-cost hot-air solar collector  
M-FS-23272 B75-10301 08

**BUOYS**

Simple and effective method to lock buoy position to ocean currents  
M-FS-23140 B75-10095 06

**C****C BAND**

Dual-band ridged waveguide  
LANGLEY-11781 B75-10091 01

**CABIN ATMOSPHERES**

Flammability study of materials in oxygen environments  
M-FS-23306 B75-10310 04

**CALIBRATING**

Ultraviolet hydrogen-discharge lamp  
MSC-14793 B75-10272 03

**CAPACITANCE**

Trielectrode capacitive pressure transducer  
ARC-10711 B75-10025 01

**CAPACITORS**

Response of tantalum capacitors to fast transient overvoltages  
MSC-14822 B75-10274 01

**CAPILLARY TUBES**

Nondestructive measurement of capillary tube internal diameter  
LANGLEY-11647 B75-10156 02

**CARBONATES**

Method for evaluating effectiveness of dry fire-extinguishing chemicals  
ARC-10869 B75-10027 04

**CARDIOLOGY**

Subminiature transducers for measuring forces and deformation of heart muscle  
NPO-13423 B75-10051 05  
Electrocardiogram signal analyzer  
MSC-12710 B75-10269 05

**CARDIOVASCULAR SYSTEM**

Catheter-tip force transducer for cardiovascular research  
NPO-13643 B75-10211 05

**CARGO**

Two-directional active damper  
LANGLEY-11815 B75-10259 06

**CATALOGS (PUBLICATIONS)**

Computer system for library access  
GSFC-11952 B75-10292 09

**CATHETERIZATION**

Catheter-tip force transducer for cardiovascular research  
NPO-13643 B75-10211 05

**CATIONS**

Covalent bonding of polycations to small polymeric particles  
NPO-13487 B75-10327 04

**CAVITY RESONATORS**

Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
HQ-10844 B75-10087 03  
Signal mixer for optical heterodyne receiver  
M-FS-23251 B75-10307 03

**CDC COMPUTERS**

Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 B75-10188 09

Automated statistical analysis program (ASAP)  
LANGLEY-11125 B75-10217 02

**CDC 3200 COMPUTER**

General optics evaluation program (GENOPTICS)  
GSFC-12038 B75-10294 09

**CDC 6000 SERIES COMPUTERS**

Executive computer program for linking independent computer programs  
ODINEX

LANGLEY-11324 B75-10194 09

Chemical equilibrium of ablation materials including condensed species  
LANGLEY-11801 B75-10225 04

Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 B75-10252 09

Static aeroelastic program

LANGLEY-11602 B75-10298 06

The Langley Research Center

NASA/PERT TIME III

LANGLEY-11887 B75-10302 09

**CELLS (BIOLOGY)**

Ionene treatment of surfaces stimulates cell growth  
NPO-13421 B75-10121 04

**CERAMIC COATINGS**

Survey of coatings for solar collectors  
LEWIS-12510 B75-10067 04

**CERAMICS**

Silicon nitride used as a rolling-element bearing material  
LEWIS-12447 B75-10134 06

Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 B75-10290 04

Repair of damaged insulation tiles

MSC-19549 B75-10321 04

Fast semiautomatic dimensional test set and data logger

MSC-19554 B75-10322 07

Fast semiautomatic dimensional test set and data logger

MSC-19554 B75-10322 07

**CHANNEL CAPACITY**

Low-noise K(u)-band receiver input system  
NPO-13645 B75-10281 02

Power spectrum analysis of staggered quadrature-phase-shift-keyed signals  
MSC-14865 B75-10318 09

**CHANNELS (DATA TRANSMISSION)**

Multiplexing technique for computer communications via satellite channels  
ARC-10879 B75-10133 09

**CHARGED PARTICLES**

Study of fluid flow by charged particles  
ARC-10925 B75-10028 03

Covalent bonding of polycations to small polymeric particles  
NPO-13487 B75-10327 04

**CHEMICAL ANALYSIS**

Automated data acquisition and reduction system for torsional braid analyzer  
LANGLEY-11578 B75-10073 02

Infrared tunable laser A concept

ARC-10463 B75-10081 03

ARC-10463 B75-10081 03

**CHEMICAL EQUILIBRIUM**

Chemical equilibrium of ablation materials including condensed species  
LANGLEY-11801 B75-10225 04

**CHEMICAL LASERS**

Chemical-ionization visible and ultraviolet gas lasers A concept  
NPO-13289 B75-10115 03

**CHEMICAL REACTORS**

Improved chemical vapor-deposition reactor  
NPO-13650 75-10212 08

**CHEMILUMINESCENCE**

Continuous detection of viable micro-organisms by chemiluminescence  
MSC-10170 75-10170 05

**CHEMOTHERAPY**

Covalent bonding of polycations to small polymeric particles  
NPO-13487 75-10327 04

New urea-absorbing polymers for artificial kidney machines  
NPO-13620 75-10336 04

**CHIMNEYS**

Airfoil disperses smokestack effluents upward  
LANGLEY-11669 75-10074 06

Handbook for estimating toxic fuel hazards  
M-FS-21114 75-10198 04

Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 75-10275 02

**CHROMATES**

Dichromated-gelatin hologram process for improved optical quality  
M-FS-23170 75-10099 03

**CHROMIUM**

Survey of coatings for solar collectors  
LEWIS-12510 75-10067 04

**CHRONOMETERS**

Quasars as very-accurate clock synchronizers  
NPO-13276 75-10114 02

**CIRCUIT BOARDS**

Improved printed-wiring boards for high-reliability circuits  
M-FS-23147 75-10039 01

**CIRCUIT PROTECTION**

A test and measurement technique for determining possible lightning-induced voltages in aircraft electrical circuits  
LEWIS-12109 75-10068 02

**CIRCUIT RELIABILITY**

Improved printed-wiring boards for high-reliability circuits  
M-FS-23147 75-10039 01

JPL transient radiation analysis by computer program (JTRAC)  
NPO-13470 75-10053 09

**CIRCUITS**

Integrated-circuit balanced parametric amplifier  
M-FS-23193 75-10102 01

Microelectronic fabrication of superconducting devices and circuits  
NPO-13419 75-10120 01

System for simultaneous bidirectional data transmission  
MSC-14810 75-10171 01

New broadband square-law detector  
NPO-13410 75-10180 02

Automated statistical analysis program (ASAP)  
LANGLEY-11125 75-10217 02

Simple temperature sensor with direct readout  
LANGLEY-11818 75-10260 01

Highly stable analog-to-digital converter  
NPO-13385 75-10277 01

Microcircuit testing and fabrication using scanning electron microscopes  
M-FS-23159 75-10304 01

**CIRCULAR POLARIZATION**

Multibeam-antenna feed system to isolate orthogonally polarized beams  
NPO-13140 75-10046 02

**CLEANING**

Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 75-10282 06

**CLINICAL MEDICINE**

Implantable prosthetic pump boosts blood pressure A concept  
NPO-13626 75-10177 05

**CLOCKS**

Quasars as very-accurate clock synchronizers  
NPO-13276 75-10114 02

**CLOSED CIRCUIT TELEVISION**

Video switcher for coupling video cameras to single TV monitor  
KSC-10782 75-10192 02

**CLOSED CYCLES**

Low-noise K(u)-band receiver input system  
NPO-13645 75-10281 02

**CLUMPS**

Method of identifying clusters representing statistical dependencies in multivariate data  
ARC-10744 75-10140 09

**COATINGS**

Dielectric films improve life of polymeric insulators  
ARC-10892 75-10084 04

Automated electronic system for measuring thermophysical properties  
LANGLEY-11883 75-10160 03

Comparative performance of twenty-three types of flat plate solar energy collectors  
LEWIS-12511 75-10189 03

Low-Cost thin-layer silicon solar cells  
GSFC-12023 75-10293 04

Flammability study of materials in oxygen environments  
M-FS-23306 75-10310 04

**COAXIAL CABLES**

Dual-band ridged waveguide  
LANGLEY-11781 75-10091 01

Temperature-stable Gunn-diode oscillator  
M-FS-23242 75-10306 01

**COBOL**

Computer system for library access  
GSFC-11952 75-10292 09

**CODERS**

One-dimensional multimode and multistate oscillator A concept  
HQ-10851 75-10088 01

**CODING**

Fluorescent color coding of power receptacles  
MSC-19504 75-10109 01

Generation of key in cryptographic system for secure communications  
NPO-13451 75-10278 09

**COEFFICIENT OF FRICTION**

Apparatus for measuring static coefficient of friction under compressive loads  
GSFC-11893 75-10214 06

**COINCIDENCE CIRCUITS**

Delay-lock-loop code-correlation synchronizer  
GSFC-11868 75-10291 02

**COLLAPSE**

Program for analysis of nonlinear equilibrium and stability (PANES)  
M-FS-23172 75-10100 09

**COLLIMATION**

Holographic direct-vision spectroscopy  
LANGLEY-11750 75-10090 03

**COLLIMATORS**

Collimation of electron and X-ray beams using zeolite crystals  
NPO-13557 75-10329 03

**COLLOIDS**

Developments in spectrophotometry II  
A multiple-frequency particle-size spectrometer  
NPO-13606 75-10333 03

Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index  
NPO-13614 75-10335 03

**COLUMNS (PROCESS ENGINEERING)**

Quick-change absorption column  
ARC-10952 75-10142 03

**COMBUSTION CHAMBERS**

Investigations of multiple jets in a crossflow  
LEWIS-12102 75-10149 03

A new high temperature noble metal thermocouple pairing  
LEWIS-12545 75-10245 03

**COMBUSTION EFFICIENCY**

Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
LEWIS-12417 75-10190 06

**COMBUSTION PRODUCTS**

Properties of air and combustion products of fuel with air  
LEWIS-12402 75-10004 03

Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
LEWIS-12417 75-10190 06

**COMMUNICATION SATELLITES**

Multiplexing technique for computer communications via satellite channels  
ARC-10879 75-10133 09

**COMPARISON**

Comparative performance of twenty-three types of flat plate solar energy collectors  
LEWIS-12511 75-10189 03

**COMPARTMENTS**

Multiple-compartment venting program  
MSC-19428 75-10234 06

**COMPASS****(PROGRAMMING LANGUAGE)**

Executive computer program for linking independent computer programs  
ODINEX  
LANGLEY-11324 75-10194 09

**COMPENSATORS**

Torque control system  
GSFC-11077 75-10085 06

**COMPILERS**

Improved general-purpose namelist processor  
LANGLEY-11834 75-10263 09

**COMPOSITE MATERIALS**

Fabrication of composite fan blades using PMR A-type polyimide resin and graphite fiber reinforcement  
LEWIS-12366 75-10066 04

Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 75-10137 04

Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 B75-10151 06  
Process for preparing polyimide adhesives  
LANGLEY-11397 B75-10257 08  
Lightweight orthotic braces  
LANGLEY-11894 B75-10303 05

**COMPRESSED AIR**

Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 B75-10282 06

**COMPRESSIBLE FLOW**

Compressible flow computer program for gas film seals  
LEWIS-12286 B75-10020 09  
Laser velocimeter measurements of high-speed compressible flows  
ARC-10781 B75-10141 03

**COMPRESSION LOADS**

Apparatus for measuring static coefficient of friction under compressive loads  
GSFC-11893 B75-10214 06

**COMPRESSION TESTS**

Biaxial compression test technique  
MSC-14883 B75-10319 08

**COMPRESSOR BLADES**

Computer program for definition of transonic axial-flow compressor blade rows  
LEWIS-12325 B75-10021 09  
Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 B75-10137 04  
Design procedure for low-drag subsonic airfoils  
LANGLEY-11351 B75-10256 03

**COMPUTER COMPONENTS**

Interface control scheme for computer high-speed interface unit  
M-FS-23083 B75-10036 01  
Optical-noise suppression unit A concept  
MSC-12640 B75-10315 03

**COMPUTER DESIGN**

Central control element expands computer capability  
M-FS-23216 B75-10103 02  
Fast Fourier transformation computer using fast counters  
NPO-13110 B75-10175 02  
Programed asynchronous serial data interrogation in a two-computer system  
GSFC-11778 B75-10184 02  
Real-time video correlator  
M-FS-23200 B75-10265 02  
Reliability computation from reliability block diagrams  
NPO-13304 B75-10276 07  
Computer/computer interface  
NPO-13428 B75-10326 02

**COMPUTER GRAPHICS**

Interactive graphical computer-aided design system  
M-FS-23157 B75-10096 01  
Simple computer method provides contours for radiological images  
ARC-10940 B75-10146 09  
Trimetric scale for drafting machines  
MSC-15829 B75-10172 09  
Small interactive image processing system (SMIPS)  
GSFC-12079 B75-10295 09

**COMPUTER PROGRAMMING**

Extensive set of macros for structured programming in OS/360 assembly language (STRCMACS)  
GSFC-11938 B75-10033 09

**COMPUTER PROGRAMS**

View factor computer program (VIEW)  
GSFC-11910 B75-10032 09  
Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
M-FS-22838 B75-10093 09  
Computer program for numerical analysis of stiffened shells of revolution  
M-FS-23027 B75-10094 09  
Program for analysis of nonlinear equilibrium and stability (PANES)  
M-FS-23172 B75-10100 09  
Computer program for analysis of vectorcardiograms (VECTAN II)  
MSC-14386 B75-10106 09  
Computer modeling of arc drivers  
ARC-10955 B75-10130 09  
RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 B75-10186 09  
Computer program for calculating water and steam properties  
LEWIS-12519 B75-10187 09  
Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 B75-10188 09  
Executive computer program for linking independent computer programs  
ODINEX  
LANGLEY-11324 B75-10194 09  
Handbook for estimating toxic fuel hazards  
M-FS-21114 B75-10198 04  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 B75-10199 06  
Automated statistical analysis program (ASAP)  
LANGLEY-11125 B75-10217 02  
Chemical equilibrium of ablation materials including condensed species  
LANGLEY-11801 B75-10225 04  
Multiple-compartment venting program  
MSC-19428 B75-10234 06  
Table-lookup algorithm for pattern recognition ELLTAB (Elliptical Table)  
MSC-14866 B75-10236 03  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 B75-10242 09  
Improved axisymmetric potential flow computer program  
LEWIS-12387 B75-10243 09  
Optical design computer program LENS II  
GSFC-11951 B75-10250 03  
Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 B75-10252 09  
Reliability computation from reliability block diagrams  
NPO-13304 B75-10276 07  
Computer system for library access  
GSFC-11952 B75-10292 09  
General optics evaluation program (GENOPTICS)  
GSFC-12038 B75-10294 09  
Static aeroelastic program  
LANGLEY-11602 B75-10298 06

The Langley Research Center  
NASA/PERT TIME III  
LANGLEY-11887 B75-10302 09

**COMPUTER STORAGE DEVICES**

One-dimensional multimode and multistate oscillator A concept  
HQ-10851 B75-10088 01  
Page composer to translate binary electrical data to optical form  
M-FS-22589 B75-10161 02  
Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 B75-10195 01  
Low-loss stripe-line coil for magnetic bubble memory  
LANGLEY-11707 B75-10196 01  
Bubble-domain circuit wafer evaluation coil set  
LANGLEY-11728 B75-10197 01

**COMPUTER SYSTEMS PROGRAMS**

Interactive graphical computer-aided design system  
M-FS-23157 B75-10096 01  
Remote file inquiry (RFI) system  
KSC-10837 B75-10155 09  
Programed asynchronous serial data interrogation in a two-computer system  
GSFC-11778 B75-10184 02  
Improved general-purpose namelist processor  
LANGLEY-11834 B75-10263 09  
Small interactive image processing system (SMIPS)  
GSFC-12079 B75-10295 09

**COMPUTERIZED DESIGN**

Interactive graphical computer-aided design system  
M-FS-23157 B75-10096 01  
Trimetric scale for drafting machines  
MSC-15829 B75-10172 09  
Improved axisymmetric potential flow computer program  
LEWIS-12387 B75-10243 09  
Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 B75-10252 09  
General optics evaluation program (GENOPTICS)  
GSFC-12038 B75-10294 09

**COMPUTERIZED SIMULATION**

Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 B75-10242 09

**COMPUTERS**

Multiplexing technique for computer communications via satellite channels  
ARC-10879 B75-10133 09

**CONCENTRATION (COMPOSITION)**

Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 B75-10275 02

**CONCENTRATORS**

Economical solar-heating or cooling system with new solar-energy concentrators  
NPO-13497 B75-10182 03

**CONDUCTIVE HEAT TRANSFER**

Compact laser through improved heat conductance  
NPO-13147 B75-10176 03

**CONDUCTIVITY METERS**

Nondestructive measurement of capillary tube internal diameter  
LANGLEY-11647 B75-10156 02

**CONDUCTORS**

Stripe-line coil for magnetic-field generation in bubble memory devices  
 LANGLEY-11705 875-10195 01

**CONFIDENCE LIMITS**

Amplifying ribbon extensometer  
 LANGLEY-11825 875-10300 06

**CONNECTORS**

Fluorescent color coding of power receptacles  
 MSC-19504 875-10109 01  
 Increasing terminal strip efficiency at cryogenic temperatures  
 M-FS-23234 875-10266 03

**CONSTRUCTION**

Solar power roof shingle  
 LEWIS-12587 875-10289 01  
 Low-cost hot-air solar collector  
 M-FS-23272 875-10301 08

**CONTACT LENSES**

Contact-eutectic-lens fabrication technique  
 M-FS-23275 875-10308 04

**CONTACT RESISTANCE**

Improved photovoltaic devices using transparent contacts  
 LANGLEY-11761 875-10220 01

**CONTAMINATION**

Continuous detection of viable micro-organisms by chemiluminescence  
 MSC-10170 875-10170 05

**CONTINUOUS WAVE LASERS**

High-power CW laser using hydrogen-fluorine reaction  
 NPO-13623 875-10183 03  
 Formation of internally-confined semiconductor lasers  
 LANGLEY-11770 875-10299 08

**CONTOURS**

Simple computer method provides contours for radiological images  
 ARC-10940 875-10146 09

**CONTROL UNITS (COMPUTERS)**

Interface control scheme for computer high-speed interface unit  
 M-FS-23083 875-10036 01  
 Buffer control unit for computer communications  
 ARC-10870 875-10059 02

**CONTROL VALVES**

Reducing flow requirements of fluid actuators  
 LANGLEY-11540 875-10258 06

**CONTROLLED ATMOSPHERES**

Ultrastructural alteration of mouse lung by prolonged exposure to mixtures of helium and oxygen  
 ARC-10929 875-10061 05  
 Oxygen cocoon for patients under intensive care  
 MSC-12663 875-10079 05

**CONVECTION**

Single crystals of metal solid solutions  
 A study  
 M-FS-23268 875-10268 03

**CONVECTIVE HEAT TRANSFER**

Regenerative cooling design and analysis computer program  
 LEWIS-12110 875-10015 09  
 Electrical gas heater with large flow range capability  
 LEWIS-12361 875-10024 03

**CONVERTERS**

Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
 HQ-10844 875-10087 03

**COOLING**

Investigations of multiple jets in a crossflow  
 LEWIS-12102 875-10149 03  
 Low-cost compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
 LEWIS-12445 875-10152 02  
 Compact laser through improved heat conductance  
 NPO-13147 875-10176 03

**COOLING SYSTEMS**

A method for measuring cooling air flow in base coolant passages of rotating turbine blades  
 LEWIS-12433 875-10017 03  
 Low-noise K(u)-band receiver input system  
 NPO-13645 875-10281 02

**COORDINATION**

Executive computer program for linking independent computer programs  
 ODINEX  
 LANGLEY-11324 875-10194 09

**COPOLYMERS**

Liquid ethylene-propylene copolymers  
 NPO-13555 875-10207 04

**COPPER**

Survey of coatings for solar collectors  
 LEWIS-12510 875-10067 04  
 Fabrication of porous plugs for control of liquid helium  
 M-FS-23218 875-10163 04

**COPPER CHLORIDES**

Double-discharge copper-vapor laser  
 NPO-13348 875-10123 03

**CORE STORAGE**

Open coil structure for bubble-memory-device packaging  
 LANGLEY-11704 875-10219 01  
 Variable-gap bias structure for magnetic bubble memory package  
 LANGLEY-11765 875-10221 01  
 A 1-1/2-level on-chip-decoding bubble memory chip design  
 LANGLEY-11766 875-10222 01

**CORRELATION DETECTION**

Multichannel high-speed correlator  
 NPO-13097 875-10323 02

**CORROSION RESISTANCE**

A superior process for forming titanium hydrogen isotopic films  
 LEWIS-12083 875-10001 03  
 Silicon nitride used as a rolling-element bearing material  
 LEWIS-12447 875-10134 06

**COST ANALYSIS**

The Langley Research Center  
 NASA/PERT TIME III  
 LANGLEY-11887 875-10302 09

**COUNTERS**

Fill-in binary loop pulse-torque quantizer  
 M-FS-23100 875-10037 02  
 Techniques for decoding speech phonemes and sounds A concept  
 GSFC-11898 875-10086 02  
 Fast Fourier transformation computer using fast counters  
 NPO-13110 875-10175 02  
 Position sensing materials wound on a reel  
 GSFC-11902 875-10249 07  
 Start/stop switches for testing detonation velocity of explosives  
 KSC-10793 875-10255 01

**COUPLERS**

Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
 HQ-10844 875-10087 03

**COVALENT BONDS**

Covalent bonding of polycations to small polymeric particles  
 NPO-13487 875-10327 04

**COVERINGS**

Comparative performance of twenty-three types of flat plate solar energy collectors  
 LEWIS-12511 875-10189 03

**COWLINGS**

Tailor making high performance graphite fiber reinforced PMR polyimides  
 LEWIS-12416 875-10137 04

**CRACKING (FRACTURING)**

Fracture toughness testing data A technology survey and bibliography  
 LEWIS-12503 875-10139 03

**CREEP RUPTURE STRENGTH**

Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
 LEWIS-12562 875-10246 04

**CREEP STRENGTH**

High strength forgeable tantalum base alloy  
 LEWIS-11386 875-10023 04

**CRITERIA**

Design criteria monograph on turbopump systems  
 LEWIS-12499 875-10135 06

**CROSS FLOW**

Investigations of multiple jets in a crossflow  
 LEWIS-12102 875-10149 03

**CRYOGENIC EQUIPMENT**

Cryogenic line insulation made from prefabricated polyurethane shells  
 MSC-19523 875-10110 06  
 Fabrication of porous plugs for control of liquid helium  
 M-FS-23218 875-10163 04  
 A two-degree Kelvin refrigerator  
 NPO-13459 875-10181 03

**CRYOGENIC FLUID STORAGE**

Increasing terminal strip efficiency at cryogenic temperatures  
 M-FS-23234 875-10266 03  
 Suspension system for lightweight cryogenic tank  
 MSC-14080 875-10270 06

**CRYOGENIC FLUIDS**

Heat-operated cryogenic electrical generator  
 NPO-13303 875-10116 03  
 Computer program for calculating thermodynamic and transport properties of fluids  
 LEWIS-12520 875-10188 09

**CRYSTAL GROWTH**

Single crystals of metal solid solutions  
 A study  
 M-FS-23268 875-10268 03

**CRYSTAL OSCILLATORS**

Continuous-phase frequency-shift-keyed generator  
 LANGLEY-11638 875-10218 02  
 Temperature-stable Gunn-diode oscillator  
 M-FS-23242 875-10306 01

**CRYSTALLOGRAPHY**

- Chemical-ionization visible and ultraviolet  
gas lasers A concept  
NPO-13289 B75-10115 03  
*Single crystals of metal solid solutions*  
A study  
M-FS-23268 B75-10268 03

**CRYSTALS**

- Collimation of electron and X-ray beams  
using zeolite crystals  
NPO-13557 B75-10329 03

**CULTURE TECHNIQUES**

- Ionene treatment of surfaces stimulates  
cell growth  
NPO-13421 B75-10121 04  
*Microbial load monitor*  
MSC-14062 B75-10167 05  
Continuous detection of viable  
micro-organisms by chemiluminescence  
MSC-10170 B75-10170 05  
*Rapid method for determination of*  
*antimicrobial susceptibilities pattern of*  
*urinary bacteria*  
GSFC-12039 B75-10253 05

**CURING**

- Curable polyphosphazenes  
M-FS-23134 B75-10038 04  
Diamine curing agents for  
polyurethanes  
LANGLEY-11829 B75-10261 08

**CURRENT AMPLIFIERS**

- New broadband square-law detector  
NPO-13410 B75-10180 02

**CUSHIONS**

- The impact of water on free-falling  
bodies  
M-FS-23310 B75-10311 03

**CUTTERS**

- Foam-machining tool with eddy-current  
transducer  
M-FS-23298 B75-10309 08

**CYCLIC LOADS**

- RETSCP-A computer program for  
analysis of rocket engine thermal strains  
with cyclic plasticity  
LEWIS-12388 B75-10186 09

**D****DAMAGE**

- Repair of damaged insulation tiles  
MSC-19549 B75-10321 04

**DAMPING**

- New design of hingeless helicopter rotor  
improves stability  
ARC-10807 B75-10132 06  
Two-directional active damper  
LANGLEY-11815 B75-10259 06

**DATA ACQUISITION**

- Automated data acquisition and  
reduction system for torsional braid  
analyzer  
LANGLEY-11578 B75-10073 02

**DATA CONVERTERS**

- Page composer to translate binary  
electrical data to optical form  
M-FS-22589 B75-10161 02

**DATA CORRELATION**

- Method of identifying clusters  
representing statistical dependencies in  
multivariate data  
ARC-10744 B75-10140 09

- Executive computer program for linking  
independent computer programs  
ODINEX  
LANGLEY-11324 B75-10194 09  
*Real-time video correlator*  
M-FS-23200 B75-10265 02  
Sound separation probe  
LEWIS-12507 B75-10286 03  
Minimization search method for data  
inversion  
NPO-99999 B75-10338 09

**DATA PROCESSING**

- Determination of bone mineral mass in  
vivo  
MSC-14276 B75-10168 05  
Fast Fourier transformation computer  
using fast counters  
NPO-13110 B75-10175 02  
Automated mass spectrometer/analysis  
system A concept  
NPO-13572 B75-10331 05

**DATA PROCESSING EQUIPMENT**

- A hybrid general-purpose bit  
synchronizer  
MSC-14330 B75-10169 02  
Computer/computer interface  
NPO-13428 B75-10326 02

**DATA RECORDERS**

- Continuous detection of viable  
micro-organisms by chemiluminescence  
MSC-10170 B75-10170 05

**DATA RECORDING**

- Digital tape drive monitor  
GSFC-11925 B75-10153 02  
Read-only optical storage medium  
M-FS-23169 B75-10305 03  
Fast semiautomatic dimensional test set  
and data logger  
MSC-19554 B75-10322 07

**DATA REDUCTION**

- Automated data acquisition and  
reduction system for torsional braid  
analyzer  
LANGLEY-11578 B75-10073 02  
Automated electronic system for  
measuring thermophysical properties  
LANGLEY-11883 B75-10160 03

**DATA RETRIEVAL**

- Remote file inquiry (RFI) system  
KSC-10837 B75-10155 09

**DATA SAMPLING**

- Computer/computer interface  
NPO-13428 B75-10326 02

**DATA STORAGE**

- Open coil structure for  
bubble-memory-device packaging  
LANGLEY-11704 B75-10219 01  
Variable-gap bias structure for magnetic  
bubble memory package  
LANGLEY-11765 B75-10221 01  
A 1-1/2-level on-chip-decoding bubble  
memory chip design  
LANGLEY-11766 B75-10222 01  
Read-only optical storage medium  
M-FS-23169 B75-10305 03

**DATA SYSTEMS**

- Interface control scheme for computer  
high-speed interface unit  
M-FS-23083 B75-10036 01  
Automated electronic system for  
measuring thermophysical properties  
LANGLEY-11883 B75-10160 03  
Microbial load monitor  
MSC-14062 B75-10167 05  
A 1-1/2-level on-chip-decoding bubble  
memory chip design  
LANGLEY-11766 B75-10222 01

- Multispectral data analysis LARSYS  
III  
MSC-14823 B75-10235 03

**DATA TRANSMISSION**

- Buffer control unit for computer  
communications  
ARC-10870 B75-10059 02  
High-speed data word monitor  
ARC-10899 B75-10129 02  
System for simultaneous bidirectional  
data transmission  
MSC-14810 B75-10171 01  
Generation of key in cryptographic  
system for secure communications  
NPO-13451 B75-10278 09  
Synchronizer for random binary data  
NPO-13286 B75-10325 02  
Computer/computer interface  
NPO-13428 B75-10326 02

**DECISION MAKING**

- Safety management of a complex R&D  
ground operating system  
LEWIS-12559 B75-10241 07

**DECODERS**

- One-dimensional multimode and  
multistate oscillator A concept  
HQ-10851 B75-10088 01  
A 1-1/2-level on-chip-decoding bubble  
memory chip design  
LANGLEY-11766 B75-10222 01

**DECODING**

- Techniques for decoding speech  
phonemes and sounds A concept  
GSFC-11898 B75-10086 02  
A hybrid general-purpose bit  
synchronizer  
MSC-14330 B75-10169 02

**DECOMMUTATORS**

- Three-phase dc motor decoder  
GSFC-11824 B75-10247 02

**DECONTAMINATION**

- Diffusion pump modification promotes  
self-cleansing and high efficiency  
LEWIS-12323 B75-10065 06

**DEHYDRATED FOOD**

- Determination of water content using  
mass spectrometry  
LANGLEY-11774 B75-10157 04  
Control of nonenzymatic browning in  
intermediate-moisture foods  
MSC-14835 B75-10317 05

**DEICERS**

- Removal of ice and marine growth from  
ship surfaces A concept  
NPO-13658 B75-10282 06

**DELTA FUNCTION**

- Dynamic delta method for trace gas  
analysis  
LANGLEY-11800 B75-10159 04

**DELTA MODULATION**

- Fill-in binary loop pulse-torque  
quantizer  
M-FS-23100 B75-10037 02

**DEMODULATION**

- A hybrid general-purpose bit  
synchronizer  
MSC-14330 B75-10169 02

**DEPOLYMERIZATION**

- Dielectric films improve life of polymeric  
insulators  
ARC-10892 B75-10084 04

**DEPOSITION**

- Improved multiple-target sputtering  
equipment  
NPO-13345 B75-10178 04



- DESCALING**  
Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 875-10282 06
- DESTRUCTIVE TESTS**  
Biaxial compression test technique  
MSC-14883 875-10319 08
- DETECTION**  
Infrared tunable laser A concept  
ARC-10463 875-10081 03  
Microbial load monitor  
MSC-14062 875-10167 05  
Continuous detection of viable micro-organisms by chemiluminescence  
MSC-10170 875-10170 05
- DETONATION**  
Start/stop switches for testing detonation velocity of explosives  
KSC-10793 875-10255 01
- DIAGRAMS**  
Reliability computation from reliability block diagrams  
NPO-13304 875-10276 07
- DIALYSIS**  
Improved ion exchange membrane  
NPO-13309 875-10117 04  
New urea-absorbing polymers for artificial kidney machines  
NPO-13620 875-10336 04
- DIAMETERS**  
Nondestructive measurement of capillary tube internal diameter  
LANGLEY-11647 875-10156 02
- DIAMINES**  
Diamine curing agents for polyurethanes  
LANGLEY-11829 875-10261 08
- DIELECTRIC PROPERTIES**  
Dielectric films improve life of polymeric insulators  
ARC-10892 875-10084 04
- DIELECTRICS**  
Measurement of trap density in dielectric film  
NPO-13443 875-10204 02
- DIFFERENTIAL EQUATIONS**  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 875-10199 06  
A study of accuracy in selected numerical-analysis integration techniques  
MSC-14802 875-10273 09
- DIFFUSION PUMPS**  
Diffusion pump modification promotes self-cleansing and high efficiency  
LEWIS-12323 875-10065 06
- DIGITAL COMPUTERS**  
Digital tape drive monitor  
GSFC-11925 875-10153 02  
Improved general-purpose namelist processor  
LANGLEY-11834 875-10263 09  
Generation of key in cryptographic system for secure communications  
NPO-13451 875-10278 09
- DIGITAL DATA**  
High-speed data word monitor  
ARC-10899 875-10129 02  
Position sensing materials wound on a reel  
GSFC-11902 875-10249 07  
Simple temperature sensor with direct readout  
LANGLEY-11818 875-10260 01
- DIGITAL SIMULATION**  
Computer modeling of arc drivers  
ARC-10955 875-10130 09
- Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 875-10199 06
- DIGITAL SYSTEMS**  
Page composer to translate binary electrical data to optical form  
M-FS-22589 875-10161 02
- DIGITAL TECHNIQUES**  
Simple computer method provides contours for radiological images  
ARC-10940 875-10146 09  
Small interactive image processing system (SMIPS)  
GSFC-12079 875-10295 09
- DIMENSIONAL MEASUREMENT**  
Nondestructive measurement of capillary tube internal diameter  
LANGLEY-11647 875-10156 02
- DIODES**  
High-performance Schottky diodes endure high temperatures  
M-FS-23184 875-10101 01  
Microwave diode amplifiers with low intermodulation distortion  
GSFC-11668 875-10213 01  
Simple temperature sensor with direct readout  
LANGLEY-11818 875-10260 01  
Temperature-stable Gunn-diode oscillator  
M-FS-23242 875-10306 01
- DIRECT CURRENT**  
High-power ac/dc variable load simulator  
MSC-14788 875-10108 02  
Solid state remote power controllers for 120 Vdc power systems  
LEWIS-12523 875-10150 02  
High-voltage stepping supply with fast settling time  
GSFC-11844 875-10191 02  
Three-phase dc motor decoder  
GSFC-11824 875-10247 02
- DIRECTIONAL ANTENNAS**  
High-efficiency K-band tracking antenna feed  
MSC-14717 875-10107 02  
Highly-efficient horn/reflector antenna  
NPO-13568 875-10330 01
- DISPERSING**  
Miniature sonar fish tag  
LANGLEY-11814 875-10092 02
- DISPERSIONS**  
Airfoil disperses smokestack effluents upward  
LANGLEY-11669 875-10074 06
- DISPLAY DEVICES**  
High-speed data word monitor  
ARC-10899 875-10129 02  
Real-time video correlator  
M-FS-23200 875-10265 02  
Small interactive image processing system (SMIPS)  
GSFC-12079 875-10295 09
- DISTORTION**  
Dichromated-gelatin hologram process for improved optical quality  
M-FS-23170 875-10099 03
- DIVING (UNDERWATER)**  
Analytic model for assessing thermal performance of SCUBA divers  
ARC-10927 875-10029 09
- DRAFTING (DRAWING)**  
Three-dimensional models aid visualization of engineering drawings  
NPO-13394 875-10179 08
- DRAFTING MACHINES**  
Trimetric scale for drafting machines  
MSC-15829 875-10172 09
- DRAG**  
Static aeroelastic program  
LANGLEY-11602 875-10298 06
- DRAG REDUCTION**  
Design procedure for low-drag subsonic airfoils  
LANGLEY-11351 875-10256 03
- DROSOPHILA**  
Acceleration of the aging process by oxygen  
ARC-10928 875-10030 05
- DRUGS**  
Improved extraction technique for biological fluids  
NPO-13084 875-10045 05
- DUCTED FANS**  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 875-10242 09
- DUCTS**  
Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 875-10173 06
- DYE LASERS**  
Infrared tunable laser A concept  
ARC-10463 875-10081 03
- DYNAMIC LOADS**  
High-power ac/dc variable load simulator  
MSC-14788 875-10108 02
- DYNAMIC PROGRAMMING**  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 875-10199 06
- DYNAMIC STABILITY**  
Two-directional active damper  
LANGLEY-11815 875-10259 06  
Static aeroelastic program  
LANGLEY-11602 875-10298 06
- DYNAMIC STRUCTURAL ANALYSIS**  
Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 875-10244 03

## E

- EARPHONES**  
Portable headset microphone checker  
KSC-10699 875-10254 02
- EARTH ATMOSPHERE**  
Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
M-FS-22838 875-10093 09
- EARTH RESOURCES**  
Data processing large quantities of multispectral information  
MSC-14472 875-10080 03
- EDDY CURRENTS**  
In-service turbine wheel crack monitor  
LEWIS-12422 875-10012 02  
Foam-machining tool with eddy-current transducer  
M-FS-23298 875-10309 08
- EFFLUENTS**  
Airfoil disperses smokestack effluents upward  
LANGLEY-11669 875-10074 06  
Processing for obtaining good quality water from sewage  
NPO-13224 875-10113 04

**ELASTOMERS**

Lightweight ducts fabricated from reinforced plastics and elastomers  
 MSC-19482 B75-10173 06  
 Dip molding to form intricately-shaped medical elastomer devices  
 NPO-13535 B75-10238 08

**ELECTRIC BATTERIES**

Machine for fabrication of battery-electrode plaques  
 GSFC-12004 B75-10216 08  
 100-ampere-hour NiCd battery system  
 MSC-14774 B75-10233 01  
 Acid/alkali bromide secondary battery  
 NPO-13237 B75-10324 01

**ELECTRIC CONNECTORS**

Flammability study of materials in oxygen environments  
 M-FS-23306 B75-10310 04

**ELECTRIC CONTACTS**

Improved photovoltaic devices using transparent contacts  
 LANGLEY-11761 B75-10220 01

**ELECTRIC CORONA**

Dielectric films improve life of polymeric insulators  
 ARC-10892 B75-10084 04

**ELECTRIC DISCHARGES**

Computer modeling of arc drivers  
 ARC-10955 B75-10130 09

**ELECTRIC ENERGY STORAGE**

Wind energy utilization A bibliography  
 LEWIS-12518 B75-10136 02  
 An experimental 100 kilowatt wind turbine generator  
 LEWIS-12509 B75-10147 03

**ELECTRIC EQUIPMENT TESTS**

A test and measurement technique for determining possible lightning-induced voltages in aircraft electrical circuits  
 LEWIS-12109 B75-10068 02

**ELECTRIC FIELD STRENGTH**

Monitor for checking electric-field meters  
 KSC-10851 B75-10296 02

**ELECTRIC GENERATORS**

Large-scale solar thermal collector concepts  
 M-FS-23167 B75-10098 03  
 Heat-operated cryogenic electrical generator  
 NPO-13303 B75-10116 03  
 Zener-regulated solar array/battery power system  
 M-FS-23195 B75-10162 02  
 Solar power roof shingle  
 LEWIS-12587 B75-10289 01  
 Low-Cost thin-layer silicon solar cells  
 GSFC-12023 B75-10293 04  
 Using permeable membranes to produce hydrogen and oxygen from water  
 MSC-12600 B75-10314 04

**ELECTRIC MOTORS**

Motor-driven rack-positioning device  
 ARC-10864 B75-10058 06  
 Three-phase dc motor decoder  
 GSFC-11824 B75-10247 02  
 Solid-state motor control and monitor system  
 MSC-12721 B75-10316 02

**ELECTRIC POWER TRANSMISSION**  
 High-power ac/dc variable load simulator  
 MSC-14788 B75-10108 02  
 Laser-to-electricity energy converter for short wavelengths  
 NPO-13390 B75-10119 03

Solid state remote power controllers for 120 Vdc power systems  
 LEWIS-12523 B75-10150 02  
 Voltage monitoring system  
 KSC-10736 B75-10154 02  
 High-voltage stepping supply with fast settling time  
 GSFC-11844 B75-10191 02

Trigger circuit forces immediate synchronization of free-running oscillator  
 NPO-13646 B75-10337 01

**ELECTRIC RELAYS**

Solid-state motor control and monitor system  
 MSC-12721 B75-10316 02

**ELECTRIC TERMINALS**

Increasing terminal strip efficiency at cryogenic temperatures  
 M-FS-23234 B75-10266 03

**ELECTRIC WIRE**

Fluorescent color coding of power receptacles  
 MSC-19504 B75-10109 01

**ELECTRICAL INSULATION**

Increasing terminal strip efficiency at cryogenic temperatures  
 M-FS-23234 B75-10266 03

**ELECTRICAL MEASUREMENT**

Microelectronic fabrication of superconducting devices and circuits  
 NPO-13419 B75-10120 01  
 Nondestructive measurement of capillary tube internal diameter  
 LANGLEY-11647 B75-10156 02

**ELECTRO-OPTICS**

Wide-field birefringent elements  
 MSC-12677 B75-10105 03  
 Optical feedback technique extends frequency response of photoconductors  
 LANGLEY-11768 B75-10223 03  
 Electro-optical detector to improve sensitivity of a focal-plane mass spectrometer  
 NPO-13524 B75-10328 03  
 Automated mass spectrometer/analysis system A concept  
 NPO-13572 B75-10331 05

**ELECTROCARDIOGRAPHY**

Computer program for analysis of vectorcardiograms (VECTAN II)  
 MSC-14386 B75-10106 09  
 Electrocardiogram signal analyzer  
 MSC-12710 B75-10269 05

**ELECTROCHEMISTRY**

Acid/alkali bromide secondary battery  
 NPO-13237 B75-10324 01

**ELECTRODES**

Trielectrode capacitive pressure transducer  
 ARC-10711 B75-10025 01  
 Machine for fabrication of battery-electrode plaques  
 GSFC-12004 B75-10216 08

**ELECTROLYTIC CELLS**

100-ampere-hour NiCd battery system  
 MSC-14774 B75-10233 01

**ELECTROMAGNETIC MEASUREMENT**

Low-cost compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
 LEWIS-12445 B75-10152 02

**ELECTROMAGNETIC PUMPS**

Implantable prosthetic pump boosts blood pressure A concept  
 NPO-13626 B75-10177 05

**ELECTROMAGNETIC SCATTERING**

Reflecting heat shields made of microstructured fused silica  
 ARC-10949 B75-10144 04

**ELECTROMAGNETIC SHIELDING**

Low-noise K(u)-band receiver input system  
 NPO-13645 B75-10281 02

**ELECTROMAGNETS**

Single radial magnetic bearing A concept  
 GSFC-11978 B75-10251 06  
 Two-directional active damper  
 LANGLEY-11815 B75-10259 06

**ELECTRON BEAMS**

Collimation of electron and X-ray beams using zeolite crystals  
 NPO-13557 B75-10329 03

**ELECTRON MICROSCOPES**

Scanning-electron-microscope used in real-time study of friction and wear  
 LEWIS-12448 B75-10064 06  
 Microcircuit testing and fabrication using scanning electron microscopes  
 M-FS-23159 B75-10304 01

**ELECTRON OPTICS**

Soft X-ray lasers using distributed-feedback reflection A concept  
 NPO-13532 B75-10239 03

**ELECTRONIC EQUIPMENT**

Shock and vibration isolation mount for small electronic components  
 NPO-13253 B75-10049 01

**ELECTRONIC EQUIPMENT TESTS**

JPL transient radiation analysis by computer program (JTRAC)  
 NPO-13470 B75-10053 09  
 Portable headset microphone checker  
 KSC-10699 B75-10254 02  
 Monitor for checking electric-field meters  
 KSC-10851 B75-10296 02

**ELECTRONIC PACKAGING**

Open coil structure for bubble-memory-device packaging  
 LANGLEY-11704 B75-10219 01  
 Variable-gap bias structure for magnetic bubble memory package  
 LANGLEY-11765 B75-10221 01

**ELECTROPLATING**

Survey of coatings for solar collectors  
 LEWIS-12510 B75-10067 04  
 Induction heating simplifies metal evaporation for ion plating  
 LEWIS-12595 B75-10288 03

**ELLIPSOMETERS**

Ellipsometer measurements of epitaxial GaAs layers A concept  
 M-FS-23238 B75-10230 01

**ENAMELS**

Survey of coatings for solar collectors  
 LEWIS-12510 B75-10067 04

**ENERGY CONVERSION**

Zener-regulated solar array/battery power system  
 M-FS-23195 B75-10162 02

**ENERGY CONVERSION EFFICIENCY**

Comparative performance of twenty-three types of flat plate solar energy collectors  
 LEWIS-12511 B75-10189 03

**ENERGY SOURCES**

Heat-operated cryogenic electrical generator  
 NPO-13303 B75-10116 03

**ENERGY STORAGE**

Solar residential heating and cooling system  
M-FS-23260 875-10165 06

**ENERGY TECHNOLOGY**

Wind energy utilization A bibliography  
LEWIS-12518 875-10136 02  
An experimental 100 kilowatt wind turbine generator  
LEWIS-12509 875-10147 03

**ENGINE CONTROL**

Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06  
Solid-state motor control and monitor system  
MSC-12721 875-10316 02

**ENGINE DESIGN**

*Design criteria monograph on axial flow turbines*  
LEWIS-12376 875-10009 06  
Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
LEWIS-12417 875-10190 06  
A new high temperature noble metal thermocouple pairing  
LEWIS-12545 875-10245 03  
Reducing flow requirements of fluid actuators  
LANGLEY-11540 875-10258 06  
Improved aircraft reaction nozzles  
ARC-10906 875-10284 06

**ENGINE NOISE**

Prediction of aircraft noise source and estimation of noise-level contours  
ARC-10880 875-10060 09

**ENGINES**

Simplified heat engine  
NPO-13613 875-10334 07

**EPITAXY**

Ellipsometer measurements of epitaxial GaAs layers A concept  
M-FS-23238 875-10230 01

**EPOXY RESINS**

Fabrication and repair of graphite/epoxy laminates  
M-FS-23228 875-10164 08  
Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 875-10173 06

**EQUATIONS**

Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 875-10244 03

**EREP**

Viewfinder/tracking system for Skylab  
MSC-14407 875-10040 03

**ERROR DETECTION CODES**

Improved general-purpose namelist processor  
LANGLEY-11834 875-10263 09

**ETCHING**

Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 875-10089 08  
Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 875-10195 01  
Low-loss stripe-line coil for magnetic bubble memory  
LANGLEY-11707 875-10196 01

**ETHYLENE**

Liquid ethylene-propylene copolymers  
NPO-13555 875-10207 04

**EUTECTIC ALLOYS**

Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 875-10246 04

**EUTECTICS**

Contact-eutectic-lens fabrication technique  
M-FS-23275 875-10308 04

**EVALUATION**

*Design criteria monograph on turbopump systems*  
LEWIS-12499 875-10135 06  
Comparative performance of twenty-three types of flat plate solar energy collectors  
LEWIS-12511 875-10189 03  
Bubble-domain circuit wafer evaluation coil set  
LANGLEY-11728 875-10197 01  
A new high temperature noble metal thermocouple pairing  
LEWIS-12545 875-10245 03  
Optical design computer program LENS II  
GSFC-11951 875-10250 03  
Industrial laser welding An evaluation  
M-FS-23237 875-10267 08  
Single crystals of metal solid solutions A study  
M-FS-23268 875-10268 03  
Influence of heat treatment on mechanical properties of 300M steel  
MSC-14792 875-10271 04  
Amplifying ribbon extensometer  
LANGLEY-11825 875-10300 06  
Quality control of microelectronic wire bonds  
M-FS-23327 875-10312 01

**EVAPORATION**

Induction heating simplifies metal evaporation for ion plating  
LEWIS-12595 875-10288 03

**EVAPORATION RATE**

Diffusion pump modification promotes self-cleansing and high efficiency  
LEWIS-12323 875-10065 06

**EVAPORATIVE COOLING**

A two-degree Kelvin refrigerator  
NPO-13459 875-10181 03

**EXHAUST GASES**

Minimization of jet and core noise by rotation of flow  
ARC-10712 875-10131 06  
Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
LEWIS-12417 875-10190 06  
Handbook for estimating toxic fuel hazards  
M-FS-21114 875-10198 04  
Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 875-10275 02

**EXHAUST SYSTEMS**

Airfoil disperses smokestack effluents upward  
LANGLEY-11669 875-10074 06  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 875-10242 09

**EXPLOSIVE DEVICES**

Powered fire nozzle for fast penetration of structures A concept  
MSC-19528 875-10111 06

**EXPLOSIVES**

Risk management technique for liquefied natural gas facilities  
KSC-11005 875-10193 04  
Start/stop switches for testing detonation velocity of explosives  
KSC-10793 875-10255 01

**EXTENSOMETERS**

Amplifying ribbon extensometer  
LANGLEY-11825 875-10300 06

**EXTINGUISHING**

Method for evaluating effectiveness of dry fire-extinguishing chemicals  
ARC-10869 875-10027 04

**EXTRACTION**

Improved extraction technique for biological fluids  
NPO-13084 875-10045 05

**EXTREMELY HIGH FREQUENCIES**

High-efficiency K-band tracking antenna feed  
MSC-14717 875-10107 02

**F****FABRICATION**

Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 875-10089 08  
High-performance Schottky diodes endure high temperatures  
M-FS-23184 875-10101 01  
Integrated-circuit balanced parametric amplifier  
M-FS-23193 875-10102 01  
Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 875-10137 04  
Fabrication of porous plugs for control of liquid helium  
M-FS-23218 875-10163 04  
Fabrication and repair of graphite/epoxy laminates  
M-FS-23228 875-10164 08  
Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 875-10173 06  
Improved multiple-target sputtering equipment  
NPC-13345 875-10178 04  
Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 875-10195 01  
Low-loss stripe-line coil for magnetic bubble memory  
LANGLEY-11707 875-10196 01  
Start/stop switches for testing detonation velocity of explosives  
KSC-10793 875-10255 01  
Diamine curing agents for polyurethanes  
LANGLEY-11829 875-10261 08  
Increasing terminal strip efficiency at cryogenic temperatures  
M-FS-23234 875-10266 03  
Low-Cost thin-layer silicon solar cells  
GSFC-12023 875-10293 04  
Formation of internally-confined semiconductor lasers  
LANGLEY-11770 875-10299 08

- Low-cost hot-air solar collector  
M-FS-23272 875-10301 08  
Lightweight orthotic braces  
LANGLEY-11894 875-10303 05  
Microcircuit testing and fabrication using scanning electron microscopes  
M-FS-23159 875-10304 01  
Read-only optical storage medium  
M-FS-23169 875-10305 03  
Contact-eutectic-lens fabrication technique  
M-FS-23275 875-10308 04  
Foam-machining tool with eddy-current transducer  
M-FS-23298 875-10309 08
- FABRICS**  
Amplifying ribbon extensometer  
LANGLEY-11825 875-10300 06  
Flammability study of materials in oxygen environments  
M-FS-23306 875-10310 04
- FAR INFRARED RADIATION**  
Superconducting quantum-interference devices  
M-FS-23163 875-10097 03
- FAR ULTRAVIOLET RADIATION**  
High-energy lasers by using distributed reflection A concept  
NPO-13346 875-10118 03
- FATIGUE (BIOLOGY)**  
Hand tremor and activity sensor  
ARC-10849 875-10057 05
- FATIGUE LIFE**  
Silicon nitride used as a rolling-element bearing material  
LEWIS-12447 875-10134 06  
Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 875-10138 03
- FEEDBACK CIRCUITS**  
Optical feedback technique extends frequency response of photoconductors  
LANGLEY-11768 875-10223 03  
Single radial magnetic bearing A concept  
GSFC-11978 875-10251 06
- FEEDBACK CONTROL**  
Foam-machining tool with eddy-current transducer  
M-FS-23298 875-10309 08
- FEEDERS**  
Regulator for intravenous feeding  
ARC-10758 875-10083 05
- FERROMAGNETIC MATERIALS**  
Ferrolubricants  
M-FS-23151 875-10078 07
- FIBER OPTICS**  
Laser action generated within a light pipe A concept  
NPO-13531 875-10127 03  
Contact-eutectic-lens fabrication technique  
M-FS-23275 875-10308 04
- FIBERS**  
Improved ion exchange membrane  
NPO-13309 875-10117 04  
Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 875-10137 04  
Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06  
Improved polyelectrolyte for ion exchange fibers  
NPO-13530 875-10280 04
- FIELD EFFECT TRANSISTORS**  
Page composer to translate binary electrical data to optical form  
M-FS-22589 875-10161 02  
Measurement of trap density in dielectric film  
NPO-13443 875-10204 02
- FIELD INTENSITY METERS**  
Monitor for checking electric-field meters  
KSC-10851 875-10296 02
- FILM THICKNESS**  
Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09
- FILTRATION**  
Microbial load monitor  
MSC-14062 875-10167 05
- FIRE EXTINGUISHERS**  
Method for evaluating effectiveness of dry fire-extinguishing chemicals  
ARC-10869 875-10027 04
- FIRE FIGHTING**  
Powered fire nozzle for fast penetration of structures A concept  
MSC-19528 875-10111 06
- FIRE PREVENTION**  
Fiber-modified polyurethane foam for ballistic protection  
ARC-10714 875-10062 04
- FIREPROOFING**  
Low-density polybenzimidazole foams for thermal insulation and fire protection  
ARC-10823 875-10056 04
- FISHES**  
Miniature sonar fish tag  
LANGLEY-11814 875-10092 02
- FITTINGS**  
Low-cost tool set for removing brazed fittings  
NPO-13495 875-10054 07
- FLAMMABILITY**  
Flammability study of materials in oxygen environments  
M-FS-23306 875-10310 04  
A flame-resistant modified polystyrene  
MSC-14903 875-10320 04
- FLAMMABLE GASES**  
Risk management technique for liquefied natural gas facilities  
KSC-11005 875-10193 04
- FLAT PLATES**  
Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 875-10244 03
- FLEXIBILITY**  
Method of attaching insulation tiles  
MSC-12619 875-10104 04  
Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 875-10173 06
- FLIGHT CONDITIONS**  
New aircraft instrument indicates turbulence intensity  
LANGLEY-11833 875-10227 03
- FLOATS**  
Highly-visible air-sea rescue marker  
MSC-12564 875-10166 05
- FLOW CHARACTERISTICS**  
Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09  
Investigations of multiple jets in a crossflow  
LEWIS-12102 875-10149 03
- FLOW DISTORTION**  
Computer program to generate engine inlet flow contour maps and distortion parameters  
LEWIS-12247 875-10005 09
- FLOW DISTRIBUTION**  
Coaxial self-aligning optical scanning system  
LANGLEY-11711 875-10034 03
- FLOW GEOMETRY**  
Minimization of jet and core noise by rotation of flow  
ARC-10712 875-10131 06
- FLOW MEASUREMENT**  
A method for measuring cooling air flow in base coolant passages of rotating turbine blades  
LEWIS-12433 875-10017 03  
Mounting technique for pressure transducers minimizes measurement interferences  
ARC-10933 875-10145 08  
Dynamic delta method for trace gas analysis  
LANGLEY-11800 875-10159 04  
Improved axisymmetric potential flow computer program  
LEWIS-12387 875-10243 09
- FLOW REGULATORS**  
Regulator for intravenous feeding  
ARC-10758 875-10083 05  
Reducing flow requirements of fluid actuators  
LANGLEY-11540 875-10258 06
- FLOW THEORY**  
Algorithm for nonlinear stationary Navier-Stokes problem  
ARC-10960 875-10143 09
- FLOW VELOCITY**  
A method for measuring cooling air flow in base coolant passages of rotating turbine blades  
LEWIS-12433 875-10017 03
- FLUID DYNAMICS**  
Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 875-10188 09
- FLUID FLOW**  
Study of fluid flow by charged particles  
ARC-10925 875-10028 03  
Algorithm for nonlinear stationary Navier-Stokes problem  
ARC-10960 875-10143 09
- FLUID MECHANICS**  
Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 875-10244 03
- FLUID POWER**  
Reducing flow requirements of fluid actuators  
LANGLEY-11540 875-10258 06
- FLUID TRANSMISSION LINES**  
Design criteria monograph on transmission seals  
LEWIS-12403 875-10011 07
- FLUIDICS**  
Braking action of wheeled vehicles is controlled automatically during minimum-distance stops  
LANGLEY-11897 875-10264 06
- FLUORESCENCE**  
Fluorescent color coding of power receptacles  
MSC-19504 875-10109 01

- Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 875-10275 02
- FLUORINE**  
High-power CW laser using hydrogen-fluorine reaction  
NPO-13623 875-10183 03
- FLUX (RATE)**  
Ultraviolet hydrogen-discharge lamp  
MSC-14793 875-10272 03
- FOAMS**  
Low-density polybenzimidazole foams for thermal insulation and fire protection  
ARC-10823 875-10056 04  
Fiber-modified polyurethane foam for ballistic protection  
ARC-10714 875-10062 04  
Foam-machining tool with eddy-current transducer  
M-FS-23298 875-10309 08
- FOOD**  
Control of nonenzymatic browning in intermediate-moisture foods  
MSC-14835 875-10317 05
- FORCED CONVECTION**  
Low-cost compact, cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 875-10152 02
- FORMING TECHNIQUES**  
Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 875-10173 06  
Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 875-10246 04
- FORTRAN**  
Computer program for thermodynamic analysis of open-cycle multishaft power system  
LEWIS-12324 875-10002 09  
Computer program to generate engine inlet flow contour maps and distortion parameters  
LEWIS-12247 875-10005 09  
Regenerative cooling design and analysis computer program  
LEWIS-12110 875-10015 09  
Computer programs for calculating potential flow in propulsion system inlets  
LEWIS-12152 875-10018 09  
Computer programs for handling propulsion system noise data  
LEWIS-12285 875-10019 09  
Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09  
Computer program for definition of transonic axial-flow compressor blade rows  
LEWIS-12325 875-10021 09  
JPL transient radiation analysis by computer program (JTRAC)  
NPO-13470 875-10053 09  
Prediction of aircraft noise source and estimation of noise-level contours  
ARC-10880 875-10060 09  
Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
M-FS-22838 875-10093 09  
Computer program for numerical analysis of stiffened shells of revolution  
M-FS-23027 875-10094 09  
Interactive graphical computer-aided design system  
M-FS-23157 875-10096 01
- Program for analysis of nonlinear equilibrium and stability (PANES)  
M-FS-23172 875-10100 09  
Computer program for analysis of vectorcardiograms (VECTAN II)  
MSC-14386 875-10106 09  
RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 875-10186 09  
Computer program for calculating water and steam properties  
LEWIS-12519 875-10187 09  
Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 875-10188 09  
Executive computer program for linking independent computer programs  
ODINEX  
LANGLEY-11324 875-10194 09  
Handbook for estimating toxic fuel hazards  
M-FS-21114 875-10198 04  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 875-10199 06  
Automated statistical analysis program (ASAP)  
LANGLEY-11125 875-10217 02  
Multiple-compartment venting program  
MSC-19428 875-10234 06  
Multispectral data analysis LARSYS III  
MSC-14823 875-10235 03  
Table-lookup algorithm for pattern recognition ELLTAB (Elliptical Table)  
MSC-14866 875-10236 03  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 875-10242 09  
Improved axisymmetric potential flow computer program  
LEWIS-12387 875-10243 09  
Optical design computer program LENS II  
GSFC-11951 875-10250 03  
Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 875-10252 09  
Improved general-purpose namelist processor  
LANGLEY-11834 875-10263 09  
Reliability computation from reliability block diagrams  
NPO-13304 875-10276 07  
General optics evaluation program (GENOPTICS)  
GSFC-12038 875-10294 09  
Small interactive image processing system (SMIPS)  
GSFC-12079 875-10295 09  
Static aeroelastic program  
LANGLEY-11602 875-10298 06  
The Langley Research Center NASA/PERT TIME III  
LANGLEY-11887 875-10302 09
- FOURIER ANALYSIS**  
Fourier waveform analyzer  
GSFC-11747 875-10070 01
- FOURIER TRANSFORMATION**  
Fast Fourier transformation computer using fast counters  
NPO-13110 875-10175 02
- FRACTURE MECHANICS**  
Design criteria monograph for metal tanks and tank components  
LEWIS-12434 875-10013 06
- FRACTURE STRENGTH**  
Fracture toughness testing data A technology survey and bibliography  
LEWIS-12503 875-10139 03  
Influence of heat treatment on mechanical properties of 300M steel  
MSC-14792 875-10271 04
- FREQUENCY MEASUREMENT**  
Variable-volume atomic storage vessel for hydrogen masers  
GSFC-11895 875-10248 03
- FREQUENCY SHIFT KEYING**  
Continuous-phase frequency-shift-keyed generator  
LANGLEY-11638 875-10218 02
- FREQUENCY STABILITY**  
Continuous-phase frequency-shift-keyed generator  
LANGLEY-11638 875-10218 02
- FRESNEL REFLECTORS**  
Economical solar-heating or cooling system with new solar-energy concentrators  
NPO-13497 875-10182 03
- FRICTION MEASUREMENT**  
Scanning-electron-microscope used in real-time study of friction and wear  
LEWIS-12448 875-10064 06  
Apparatus for measuring static coefficient of friction under compressive loads  
GSFC-11893 875-10214 06
- FUEL CELLS**  
Fiber-modified polyurethane foam for ballistic protection  
ARC-10714 875-10062 04  
Heat-operated cryogenic electrical generator  
NPO-13303 875-10116 03  
Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04  
Acid/alkali bromide secondary battery  
NPO-13237 875-10324 01  
Reconstituted asbestos matrix for fuel cells  
MSC-12568 875-10339 04
- FUEL CONSUMPTION**  
Gas generators produce hydrogen-rich fuel  
NPO-13342 875-10203 06  
Hydrogen-rich gas generators to reduce air pollution and improve gasoline economy  
NPO-13560 875-10208 06  
Steam automobile analysis  
M-FS-23188 875-10229 03  
Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 875-10290 04
- FUEL INJECTION**  
Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
LEWIS-12417 875-10190 06
- FUEL SYSTEMS**  
Design criteria monograph for metal tanks and tank components  
LEWIS-12434 875-10013 06  
Cryogenic line insulation made from prefabricated polyurethane shells  
MSC-19523 875-10110 06

Gas generators produce hydrogen-rich fuel  
NPO-13342 875-10203 06  
Hydrogen-rich gas generators to reduce air pollution and improve gasoline economy  
NPO-13560 875-10208 06

**FUEL TANK PRESSURIZATION**

Design criteria monograph for metal tanks and tank components  
LEWIS-12434 875-10013 06

**FUELS**

Handbook for estimating toxic fuel hazards  
M-FS-21114 875-10198 04

**G****GALLIUM ARSENIDES**

High-performance Schottky diodes endure high temperatures  
M-FS-23184 875-10101 01  
Schottky barrier solar cell promises improved efficiency  
NPO-13482 875-10125 03  
Ellipsometer measurements of epitaxial GaAs layers A concept  
M-FS-23238 875-10230 01

**GAS ANALYSIS**

A nondispersive infrared analyzer  
ARC-10631 875-10082 03  
Dynamic delta method for trace gas analysis  
LANGLEY-11800 875-10159 04  
Characteristics and performance study of mass spectrometer residual gas analyzers  
LEWIS-12393 875-10185 03

**GAS BEARINGS**

Gas bearing operates in vacuum  
NPO-13425 875-10052 06

**GAS CHROMATOGRAPHY**

Low-cost compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 875-10152 02

**GAS DISCHARGE TUBES**

Apparatus for study of plasmas at elevated temperatures  
ARC-10958 875-10285 03

**GAS FLOW**

Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09  
Electrical gas heater with large flow range capability  
LEWIS-12361 875-10024 03  
Improved chemical vapor-deposition reactor  
NPO-13650 875-10212 08  
Multiple-compartment venting program  
MSC-19428 875-10234 06

**GAS GENERATORS**

Gas generators produce hydrogen-rich fuel  
NPO-13342 875-10203 06  
Hydrogen-rich gas generators to reduce air pollution and improve gasoline economy  
NPO-13560 875-10208 06  
Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04

**GAS HEATING**

Electrical gas heater with large flow range capability  
LEWIS-12361 875-10024 03

**GAS LASERS**

Laser using lead chloride vapor  
NPO-13615 875-10128 03  
Industrial laser welding An evaluation  
M-FS-23237 875-10267 08

**GAS MASERS**

Variable-volume atomic storage vessel for hydrogen masers  
GSFC-11895 875-10248 03

**GAS PRESSURE**

Multiple-compartment venting program  
MSC-19428 875-10234 06

**GAS STREAMS**

Investigations of multiple jets in a crossflow  
LEWIS-12102 875-10149 03

**GAS TURBINE ENGINES**

Computer program to generate engine inlet flow contour maps and distortion parameters  
LEWIS-12247 875-10005 09

**GAS TURBINES**

Properties of air and combustion products of fuel with air  
LEWIS-12402 875-10004 03  
Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 875-10244 03  
Turbine design review text  
LEWIS-12560 875-10287 06  
Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 875-10290 04

**GAS-METAL INTERACTIONS**

Induction heating simplifies metal evaporation for ion plating  
LEWIS-12595 875-10288 03

**GASOLINE**

Gas generators produce hydrogen-rich fuel  
NPO-13342 875-10203 06  
Hydrogen-rich gas generators to reduce air pollution and improve gasoline economy  
NPO-13560 875-10208 06

**GEARS**

Design criteria monograph on turbopump gears  
LEWIS-12377 875-10010 06

**GELATINS**

Dichromated-gelatin hologram process for improved optical quality  
M-FS-23170 875-10099 03

**GEOGRAPHY**

Multispectral data analysis LARSYS III  
MSC-14823 875-10235 03

**GEOLOGY**

Multispectral data analysis LARSYS III

**GEOPHYSICS**

Quasars as very-accurate clock synchronizers  
NPO-13276 875-10114 02

**GERONTOLOGY**

Acceleration of the aging process by oxygen  
ARC-10928 875-10030 05

**GLASS FIBERS**

Suspension system for lightweight cryogenic tank  
MSC-14080 875-10270 06

**GLIDERS**

New aircraft instrument indicates turbulence intensity  
LANGLEY-11833 875-10227 03

**GOLD COATINGS**

Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 875-10089 08

**GONDOLAS**

Torque control system  
GSFC-11077 875-10085 06

**GRAPHIC ARTS**

Three-dimensional models aid visualization of engineering drawings  
NPO-13394 875-10179 08

**GRAPHITE**

Fabrication of composite fan blades using PMR A-type polyimide resin and graphite fiber reinforcement  
LEWIS-12366 875-10066 04  
Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 875-10137 04  
Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06  
Fabrication and repair of graphite/epoxy laminates  
M-FS-23228 875-10164 08  
Low-Cost thin-layer silicon solar cells  
GSFC-12023 875-10293 04

**GRAVITATIONAL EFFECTS**

Single crystals of metal solid solutions A study  
M-FS-23268 875-10268 03

**GUNN EFFECT**

Temperature-stable Gunn-diode oscillator  
M-FS-23242 875-10306 01

**GUST ALLEVIATORS**

Gust alleviation system to improve ride comfort of light airplanes  
LANGLEY-11771 875-10224 03

**H****HAND (ANATOMY)**

Hand tremor and activity sensor  
ARC-10849 875-10057 05

**HANDBOOKS**

Turbine design review text  
LEWIS-12560 875-10287 06  
Flammability study of materials in oxygen environments  
M-FS-23306 875-10310 04

**HANKEL FUNCTIONS**

Fast Fourier transformation computer using fast counters  
NPO-13110 875-10175 02

**HARDNESS TESTS**

Fracture toughness testing data A technology survey and bibliography  
LEWIS-12503 875-10139 03

**HARMONIC ANALYSIS**

Real-time speech analyzer  
NPO-13465 875-10205 02  
Microwave diode amplifiers with low intermodulation distortion  
GSFC-11668 875-10213 01

**HARMONICS**

Real-time speech analyzer  
NPO-13465 B75-10205 02

**HAZARDS**

Risk management technique for liquefied natural gas facilities  
KSC-11005 B75-10193 04  
Safety management of a complex R&D ground operating system  
LEWIS-12559 B75-10241 07

**HEART DISEASES**

Electrocardiogram signal analyzer  
MSC-12710 B75-10269 05

**HEART FUNCTION**

Subminiature transducers for measuring forces and deformation of heart muscle  
NPO-13423 B75-10051 05

**HEART RATE**

Mobile automatic metabolic analyzer  
M-FS-23143 B75-10077 05  
Catheter-tip force transducer for cardiovascular research  
NPO-13643 B75-10211 05

**HEAT EXCHANGERS**

Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 B75-10244 03

**HEAT PIPES**

Secondary reflectors for economical sun-tracking energy collection system A concept  
NPO-13580 B75-10210 03  
Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 B75-10252 09  
Compound heat pipe operates over broad temperature range  
M-FS-23329 B75-10313 06

**HEAT RESISTANT ALLOYS**

High-strength rivet does not require aging  
MSC-19301 B75-10044 06

**HEAT SHIELDING**

Thin KAPTON polyimide films vacuum formed at high temperature retain their shape at temperatures to 450 K (350 F)  
LEWIS-12412 B75-10016 04  
Reflecting heat shields made of microstructured fused silica  
ARC-10949 B75-10144 04

**HEAT SINKS**

Increasing terminal strip efficiency at cryogenic temperatures  
M-FS-23234 B75-10266 03

**HEAT STORAGE**

Large-scale solar thermal collector concepts  
M-FS-23167 B75-10098 03

**HEAT TRANSFER**

Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
LEWIS-12558 B75-10244 03  
Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 B75-10252 09

**HEAT TREATMENT**

Influence of heat treatment on mechanical properties of 300M steel  
MSC-14792 B75-10271 04

**HEATING**

Solar residential heating and cooling system  
M-FS-23260 B75-10165 06

Economical solar-heating or cooling system with new solar-energy concentrators  
NPO-13497 B75-10182 03

Comparative performance of twenty-three types of flat plate solar energy collectors  
LEWIS-12511 B75-10189 03

Low-cost hot-air solar collector  
M-FS-23272 B75-10301 08

**HEATING EQUIPMENT**

Heater improves cold-temperature capacity of silver-cadmium batteries  
GSFC-11913 B75-10071 01  
Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 B75-10282 06

**HELICOPTER DESIGN**

Design criteria monograph on transmission seals  
LEWIS-12403 B75-10011 07  
New design of hingeless helicopter rotor improves stability  
ARC-10807 B75-10132 06

**HELICOPTERS**

New aircraft instrument indicates turbulence intensity  
LANGLEY-11833 B75-10227 03

**HELIUM**

Ultrastructural alteration of mouse lung by prolonged exposure to mixtures of helium and oxygen  
ARC-10929 B75-10061 05

**HEPARINS**

Covalent bonding of polycations to small polymeric particles  
NPO-13487 B75-10327 04

**HERMETIC SEALS**

Nongassing NiCd battery cell  
NPO-11853 B75-10174 04

**HIGH ALTITUDE BALLOONS**

Torque control system  
GSFC-11077 B75-10085 06

**HIGH STRENGTH**

Diamine curing agents for polyurethanes  
LANGLEY-11829 B75-10261 08

**HIGH STRENGTH ALLOYS**

High strength forgeable tantalum base alloy  
LEWIS-11386 B75-10023 04

High-strength rivet does not require aging  
MSC-19301 B75-10044 06

Aluminum alloys with improved strength  
M-FS-23239 B75-10200 04

**HIGH TEMPERATURE ENVIRONMENTS**

High-performance Schottky diodes endure high temperatures  
M-FS-23184 B75-10101 01

Silicon nitride used as a rolling-element bearing material  
LEWIS-12447 B75-10134 06

Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 B75-10151 06

A new high temperature noble metal thermocouple pairing  
LEWIS-12545 B75-10245 03

Compound heat pipe operates over broad temperature range  
M-FS-23329 B75-10313 06

**HIGH TEMPERATURE LUBRICANTS**

Long life high speed thrust-load ball bearings  
LEWIS-12269 B75-10022 06

**HIGH TEMPERATURE TESTS**

Apparatus for study of plasmas at elevated temperatures  
ARC-10958 B75-10285 03

**HIGH VACUUM**

Characteristics and performance study of mass spectrometer residual gas analyzers  
LEWIS-12393 B75-10185 03

**HIGH VOLTAGES**

High-power ac/dc variable load simulator  
MSC-14788 B75-10108 02  
Schottky barrier solar cell promises improved efficiency  
NPO-13482 B75-10125 03  
High-voltage stepping supply with fast settling time  
GSFC-11844 B75-10191 02

**HILSCH TUBES**

Low-cost compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 B75-10152 02

**HOLOGRAPHY**

Holographic direct-vision spectroscopy  
LANGLEY-11750 B75-10090 03  
Dichromated-gelatin hologram process for improved optical quality  
M-FS-23170 B75-10099 03

Page composer to translate binary electrical data to optical form  
M-FS-22589 B75-10161 02

Read-only optical storage medium  
M-FS-23169 B75-10305 03

Optical-noise suppression unit A concept  
MSC-12640 B75-10315 03

**HORN ANTENNAS**

Highly-efficient horn/reflector antenna  
NPO-13568 B75-10330 01

**HOSES**

Low-cost portable fire hose tester  
LEWIS-12365 B75-10003 06

**HUMAN FACTORS ENGINEERING**

Safety management of a complex R&D ground operating system  
LEWIS-12559 B75-10241 07

**HUMAN REACTIONS**

Hand tremor and activity sensor  
ARC-10849 B75-10057 05

**HUMAN TOLERANCES**

Analytic model for assessing thermal performance of SCUBA divers  
ARC-10927 B75-10029 09

**HUMIDITY MEASUREMENT**

Quartz crystal microbalances to measure wind velocity and air humidity  
NPO-13462 B75-10124 03

**HYBRID CIRCUITS**

A hybrid general-purpose bit synchronizer  
MSC-14330 B75-10169 02

Quality control of microelectronic wire bonds  
M-FS-23327 B75-10312 01

**HYDRAULIC CONTROL**

Braking action of wheeled vehicles is controlled automatically during minimum-distance stops  
LANGLEY-11897 B75-10264 06

**HYDRAULIC EQUIPMENT**

Powered fire nozzle for fast penetration of structures A concept  
MSC-19528 875-10111 06

**HYDRAZINES**

High-power CW laser using hydrogen-fluorine reaction  
NPO-13623 875-10183 03

**HYDRODYNAMICS**

Computer program for calculating water and steam properties  
LEWIS-12519 875-10187 09  
Computer integration of hydrodynamics equations for heat pipes  
GSFC-12009 875-10252 09

**HYDROFOILS**

Design procedure for low-drag subsonic airfoils  
LANGLEY-11351 875-10256 03

**HYDROGEN**

Ultraviolet hydrogen-discharge lamp  
MSC-14793 875-10272 03  
Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04  
Acid/alkali bromide secondary battery  
NPO-13237 875-10324 01

**HYDROGEN FUELS**

Gas generators produce hydrogen-rich fuel  
NPO-13342 875-10203 06  
Hydrogen-rich gas generators to reduce air pollution and improve gasoline economy  
NPO-13560 875-10208 06

**HYDROGEN ISOTOPES**

A superior process for forming titanium hydrogen isotopic films  
LEWIS-12083 875-10001 03

**HYDROLOGY**

Multispectral data analysis LARSYS III  
MSC-14823 875-10235 03

**HYPEROXIA**

Acceleration of the aging process by oxygen  
ARC-10928 875-10030 05

**IBM 360 COMPUTER**

Regenerative cooling design and analysis computer program  
LEWIS-12110 875-10015 09  
Computer programs for handling propulsion system noise data  
LEWIS-12285 875-10019 09  
Computer program for definition of transonic axial-flow compressor blade rows  
LEWIS-12325 875-10021 09  
View factor computer program (VIEW)  
GSFC-11910 875-10032 09  
Extensive set of macros for structured programming in OS/360 assembly language (STRCMACS)  
GSFC-11938 875-10033 09  
Prediction of aircraft noise source and estimation of noise-level contours  
ARC-10880 875-10060 09  
Remote file inquiry (RFI) system  
KSC-10837 875-10155 09  
Multiple-compartment venting program  
MSC-19428 875-10234 06

Multispectral data analysis LARSYS

III  
MSC-14823 875-10235 03  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 875-10242 09  
Optical design computer program LENS

**II**

GSFC-11951 875-10250 03  
Computer system for library access  
GSFC-11952 875-10292 09  
Small interactive image processing system (SMIPS)  
GSFC-12079 875-10295 09

**IBM 7044 COMPUTER**

Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09

**IBM 7090 COMPUTER**

Computer program for thermodynamic analysis of open-cycle multishaft power system  
LEWIS-12324 875-10002 09  
Computer program for definition of transonic axial-flow compressor blade rows  
LEWIS-12325 875-10021 09

**IBM 7094 COMPUTER**

Computer program for thermodynamic analysis of open-cycle multishaft power system  
LEWIS-12324 875-10002 09  
Computer program to generate engine inlet flow contour maps and distortion parameters  
LEWIS-12247 875-10005 09  
Computer programs for calculating potential flow in propulsion system inlets  
LEWIS-12152 875-10018 09  
Computer programs for handling propulsion system noise data  
LEWIS-12285 875-10019 09  
Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09  
Computer program for definition of transonic axial-flow compressor blade rows  
LEWIS-12325 875-10021 09  
RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 875-10186 09  
Computer program for calculating water and steam properties  
LEWIS-12519 875-10187 09  
Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 875-10188 09  
Automated statistical analysis program (ASAP)  
LANGLEY-11125 875-10217 02  
Computer program for the attenuation of high bypass turbofan engine noise  
LEWIS-12179 875-10242 09

**ICE**

Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 875-10282 06

**IDENTIFYING**

Fluorescent color coding of power receptacles  
MSC-19504 875-10109 01  
Microbial load monitor  
MSC-14062 875-10167 05

**IMAGE CONVERTERS**

Laser scanned image sensors using photoconductors with deep traps  
NPO-13131 875-10112 03

**IMAGE ENHANCEMENT**

Simple computer method provides contours for radiological images  
ARC-10940 875-10146 09

**IMAGE FILTERS**

Wide-field birefringent elements  
MSC-12677 875-10105 03

**IMAGING TECHNIQUES**

Coaxial, self-aligning optical scanning system  
LANGLEY-11711 875-10034 03  
Data processing large quantities of multispectral information  
MSC-14472 875-10080 03

**IMPACT DAMAGE**

The impact of water on free-falling bodies  
M-FS-23310 875-10311 03

**IMPACT LOADS**

The impact of water on free-falling bodies  
M-FS-23310 875-10311 03

**IMPLANTATION**

Dip molding to form intricately-shaped medical elastomer devices  
NPO-13535 875-10238 08

**INDUCTION HEATING**

Induction heating simplifies metal evaporation for ion plating  
LEWIS-12595 875-10288 03

**INDUSTRIAL SAFETY**

Solid state remote power controllers for 120 Vdc power systems  
LEWIS-12523 875-10150 02  
Risk management technique for liquefied natural gas facilities  
KSC-11005 875-10193 04  
Handbook for estimating toxic fuel hazards  
M-FS-21114 875-10198 04  
Safety management of a complex R&D ground operating system  
LEWIS-12559 875-10241 07

**INFLATABLE STRUCTURES**

Highly-visible air-sea rescue marker  
MSC-12564 875-10166 05  
Amplifying ribbon extensometer  
LANGLEY-11825 875-10300 06

**INFORMATION RETRIEVAL**

Remote file inquiry (RFI) system  
KSC-10837 875-10155 09  
Generation of key in cryptographic system for secure communications  
NPO-13451 875-10278 09  
Computer system for library access  
GSFC-11952 875-10292 09

**INFRARED DETECTORS**

Automated electronic system for measuring thermophysical properties  
LANGLEY-11883 875-10160 03

**INFRARED LASERS**

Infrared tunable laser A concept  
ARC-10463 875-10081 03  
Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 875-10275 02

**INFRARED SPECTROMETERS**

Viewfinder/tracking system for Skylab  
MSC-14407 875-10040 03  
Tuneable diode laser spectrometer with integral grating  
LANGLEY-11830 875-10262 03



**INFRARED SPECTROSCOPY**

A nondispersive infrared analyzer  
ARC-10631 B75-10082 03

**INJECTION LASERS**

High-energy lasers by using distributed reflection A concept  
NPO-13346 B75-10118 03

**INLET FLOW**

Computer programs for calculating potential flow in propulsion system inlets  
LEWIS-12152 B75-10018 09

**INSPECTION**

Fast semiautomatic dimensional test set and data logger  
MSC-19554 B75-10322 07

**INSTALLING**

Method of attaching insulation tiles  
MSC-12619 B75-10104 04

**INSTRUMENT COMPENSATION**

A nondispersive infrared analyzer  
ARC-10631 B75-10082 03

**INSULATION**

Thin KAPTON polyimide films vacuum formed at high temperature retain their shape at temperatures to 450 K (350 F)  
LEWIS-12412 B75-10016 04  
High-temperature, reusable surface insulation system  
MSC-14688 B75-10042 04

**INSULATORS**

Dielectric films improve life of polymeric insulators  
ARC-10892 B75-10084 04

**INTEGRATED CIRCUITS**

One-dimensional multimode and multistate oscillator A concept  
HQ-10851 B75-10088 01  
Solar-cell interconnects  
M-FS-23257 B75-10231 04  
Trigger circuit forces immediate synchronization of free-running oscillator  
NPO-13646 B75-10337 01

**INTERFACES**

Computer/computer interface  
NPO-13428 B75-10326 02

**INTERFERENCE GRATING**

Tuneable diode laser spectrometer with integral grating  
LANGLEY-11830 B75-10262 03

**INTERFEROMETERS**

Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
HQ-10844 B75-10087 03  
Developments in spectrophotometry I  
An instrument for high-resolution measurements of optical intensity and polarization  
NPO-13604 B75-10332 03

**INTERFEROMETRY**

Read-only optical storage medium  
M-FS-23169 B75-10305 03

**INTERMEDIATE****FREQUENCY****AMPLIFIERS**

New broadband square-law detector  
NPO-13410 B75-10180 02

**INTERMODULATION**

Microwave diode amplifiers with low intermodulation distortion  
GSFC-11668 B75-10213 01

**INTERNAL COMBUSTION ENGINES**

Solid-state motor control and monitor system  
MSC-12721 B75-10316 02

**INTRAVENOUS PROCEDURES**

Regulator for intravenous feeding  
ARC-10758 B75-10083 05

**INVERTERS**

Trigger circuit forces immediate synchronization of free-running oscillator  
NPO-13646 B75-10337 01

**INVESTIGATION**

Flammability study of materials in oxygen environments  
M-FS-23306 B75-10310 04  
Quality control of microelectronic wire bonds  
M-FS-23327 B75-10312 01

**ION CURRENTS**

Study of fluid flow by charged particles  
ARC-10925 B75-10028 03

**ION EXCHANGE RESINS**

Improved ion exchange membrane  
NPO-13309 B75-10117 04  
Improved polyelectrolyte for ion exchange fibers  
NPO-13530 B75-10280 04

**ION EXCHANGING**

Improved polyelectrolyte for ion exchange fibers  
NPO-13530 B75-10280 04

**ION EXTRACTION**

Characteristics and performance study of mass spectrometer residual gas analyzers  
LEWIS-12393 B75-10185 03

**ION RECOMBINATION**

Induction heating simplifies metal evaporation for ion plating  
LEWIS-12595 B75-10288 03

**IONIC REACTIONS**

Chemical-ionization visible and ultraviolet gas lasers A concept  
NPO-13289 B75-10115 03

**IRRADIANCE**

Uniform high irradiance source  
LEWIS-12360 B75-10008 03

**ISOCYANATES**

Diamine curing agents for polyurethanes  
LANGLEY-11829 B75-10261 08

**J****JET AIRCRAFT NOISE**

Computer programs for handling propulsion system noise data  
LEWIS-12285 B75-10019 09  
Sound separation probe  
LEWIS-12507 B75-10286 03

**JET ENGINE FUELS**

Properties of air and combustion products of fuel with air  
LEWIS-12402 B75-10004 03

**JET ENGINES**

Minimization of jet and core noise by rotation of flow  
ARC-10712 B75-10131 06

Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 B75-10246 04

Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 B75-10290 04

**JET FLOW**

Improved aircraft reaction nozzles  
ARC-10906 B75-10284 06

**JET MIXING FLOW**

Investigations of multiple jets in a crossflow  
LEWIS-12102 B75-10149 03

**JET PROPULSION**

Turbine design review text  
LEWIS-12560 B75-10287 06

**JET THRUST**

Improved aircraft reaction nozzles  
ARC-10906 B75-10284 06

**JET VANES**

Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 B75-10137 04

**JOINING**

Solar-cell interconnects  
M-FS-23257 B75-10231 04

**JOINTS (ANATOMY)**

Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 B75-10148 05

**JOSEPHSON JUNCTIONS**

Superconducting quantum-interference devices  
M-FS-23163 B75-10097 03

**JOURNAL BEARINGS**

Design curves for optimizing stability of herringbone-grooved journal bearings  
LEWIS-12442 B75-10063 06

**K****KALMAN-SCHMIDT FILTERING**

A study of accuracy in selected numerical-analysis integration techniques  
MSC-14802 B75-10273 09

**KAPTON (TRADEMARK)**

Thin KAPTON polyimide films vacuum formed at high temperature retain their shape at temperatures to 450 K (350 F)  
LEWIS-12412 B75-10016 04

**KIDNEYS**

New urea-absorbing polymers for artificial kidney machines  
NPO-13620 B75-10336 04

**KIRKENDALL EFFECT**

Inhibiting Kirkendall void growth in welded bimetallic structures  
LEWIS-11573 B75-10006 08

**KLYSTRONS**

Transmitter switch for high-power microwave output  
NPO-13439 B75-10122 02

**L****LABORATORY EQUIPMENT**

Developments in spectrophotometry I  
An instrument for high-resolution measurements of optical intensity and polarization  
NPO-13604 B75-10332 03

**LAMINATES**

Isometric scan method for ultrasonic evaluation of composite panels  
LEWIS-12437 B75-10014 01  
Fabrication and repair of graphite/epoxy laminates  
M-FS-23228 B75-10164 08  
Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 B75-10173 06

**LANDING GEAR**

Low-profile landing-gear assembly  
ARC-10786 B75-10055 06

**LARGE SCALE INTEGRATION**

Interactive graphical computer-aided design system  
M-FS-23157 B75-10096 01

**LASER OUTPUTS**

Acoustically controlled integrated laser for communications systems  
NPO-13175 B75-10047 03  
Laser using lead chloride vapor  
NPO-13615 B75-10128 03  
Optical-noise suppression unit A concept  
MSC-12640 B75-10315 03

**LASERS**

Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
HQ-10844 B75-10087 03  
Laser scanned image sensors using photoconductors with deep traps  
NPO-13131 B75-10112 03  
High-energy lasers by using distributed reflection A concept  
NPO-13346 B75-10118 03  
Laser-to-electricity energy converter for short wavelengths  
NPO-13390 B75-10119 03  
Double-discharge copper-vapor laser  
NPO-13348 B75-10123 03  
Laser action generated within a light pipe A concept  
NPO-13531 B75-10127 03  
Laser velocimeter measurements of high-speed compressible flows  
ARC-10781 B75-10141 03  
Diffused guides for distributed-feedback lasers  
NPO-13544 B75-10206 03  
Signal mixer for optical heterodyne receiver  
M-FS-23251 B75-10307 03

**LAYERS**

Position sensing materials wound on a reel  
GSFC-11902 B75-10249 07

**LC CIRCUITS**

Temperature-stable Gunn-diode oscillator  
M-FS-23242 B75-10306 01

**LEAD CHLORIDES**

Laser using lead chloride vapor  
NPO-13615 B75-10128 03

**LEADING EDGES**

New design of hingeless helicopter rotor improves stability  
ARC-10807 B75-10132 06

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Design criteria monograph on transmission seals  
LEWIS-12403 B75-10011 07

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Lightweight orthotic braces  
LANGLEY-11894 B75-10303 05

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MSC-14724 B75-10043 03  
Optical design computer program LENS II  
GSFC-11951 B75-10250 03  
Contact-eutectic-lens fabrication technique  
M-FS-23275 B75-10308 04

**LENSES**

Refracting lens system for low-scatter star-tracker A Concept  
MSC-14724 B75-10043 03

General optics evaluation program (GENOPTICS)  
GSFC-12038 B75-10294 09

**LEVITATION**

Levitration of objects using acoustic energy  
M-FS-23261 B75-10232 03

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GSFC-11952 B75-10292 09

**LIFE (DURABILITY)**

Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 B75-10290 04

**LIGHT AIRCRAFT**

Gust alleviation system to improve ride comfort of light airplanes  
LANGLEY-11771 B75-10224 03

**LIGHT AMPLIFIERS**

Infrared tunable laser A concept  
ARC-10463 B75-10081 03

**LIGHT EMISSION**

Chemical-ionization visible and ultraviolet gas lasers A concept  
NPO-13289 B75-10115 03

**LIGHT MODULATION**

Wide-field birefringent elements  
MSC-12677 B75-10105 03

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MSC-14724 B75-10043 03  
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NPO-13531 B75-10127 03

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NPO-13606 B75-10333 03  
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NPO-13614 B75-10335 03

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LEWIS-12109 B75-10068 02  
Time-of-arrival lightning activity location system  
KSC-11006 B75-10297 02

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A study of accuracy in selected numerical-analysis integration techniques  
MSC-14802 B75-10273 09

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LEWIS-12514 B75-10151 06

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Risk management technique for liquefied natural gas facilities  
KSC-11005 B75-10193 04

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Heat-operated cryogenic electrical generator  
NPO-13303 B75-10116 03  
High-energy lasers by using distributed reflection A concept  
NPO-13346 B75-10118 03

Fabrication of porous plugs for control of liquid helium  
M-FS-23218 B75-10163 04  
A two-degree Kelvin refrigerator  
NPO-13459 B75-10181 03  
Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 B75-10188 09

**LIQUID NITROGEN**

Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 B75-10188 09

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Design criteria monograph on axial flow turbines  
LEWIS-12376 B75-10009 06  
RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 B75-10186 09

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Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 B75-10195 01

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NPO-13626 B75-10177 05

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MSC-14883 B75-10319 08

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Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 B75-10138 03

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Central control element expands computer capability  
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M-FS-23100 B75-10037 02

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ARC-10823 B75-10056 04  
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Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 B75-10173 06  
Compound heat pipe operates over broad temperature range  
M-FS-23329 B75-10313 06

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ARC-10906 B75-10284 06

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NPO-13535 B75-10238 08

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NPO-13490 B75-10279 03

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Sputtered gold mask for deep chemical  
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LANGLEY-11661 B75-10089 08

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MSC-14276 B75-10168 05

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magnetic fields up to 1400 Gauss  
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LEWIS-12598 B75-10283 01  
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NPO-13626 B75-10177 05  
Catheter-tip force transducer for  
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Dip molding to form intricately-shaped  
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Quartz crystal microbalances to measure wind velocity and air humidity  
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NPO-13131 875-10112 03  
Page composer to translate binary electrical data to optical form  
M-FS-22589 875-10161 02  
Read-only optical storage medium  
M-FS-23169 875-10305 03  
Optical-noise suppression unit A concept  
MSC-12640 875-10315 03

**OPTICAL EQUIPMENT**

Visual alignment aid  
LANGLEY-11842 875-10228 03  
General optics evaluation program (GENOPTICS)  
GSFC-12038 875-10294 09

**OPTICAL FILTERS**

Angular device for optical filters  
LANGLEY-11796 875-10158 03  
Tuneable diode laser spectrometer with integral grating  
LANGLEY-11830 875-10262 03

**OPTICAL HETERODYNING**

Signal mixer for optical heterodyne receiver  
M-FS-23251 875-10307 03

**OPTICAL MEASUREMENT**

Developments in spectrophotometry I  
An instrument for high-resolution measurements of optical intensity and polarization  
NPO-13604 875-10332 03  
Developments in spectrophotometry II  
A multiple-frequency particle-size spectrometer  
NPO-13606 875-10333 03  
Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index  
NPO-13614 875-10335 03

**OPTICAL MICROSCOPES**

Automatically-focusing microscope system for live tissue observation  
NPO-13215 875-10048 03

**OPTICAL PROPERTIES**

Wide-field birefringent elements  
MSC-12677 875-10105 03

**OPTICAL REFLECTION**

Microbial load monitor  
MSC-14062 875-10167 05

**OPTICAL SCANNERS**

Coaxial, self-aligning optical scanning system  
LANGLEY-11711 875-10034 03

**OPTICAL TRACKING**

Viewfinder/tracking system for Skylab  
MSC-14407 875-10040 03

**OPTIMIZATION**

Minimization search method for data inversion  
NPO-99999 875-10338 09

**ORGANIC LIQUIDS**

Determination of water content using mass spectrometry  
LANGLEY-11774 875-10157 04

**ORTHOPEDICS**

Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 875-10148 05  
Lightweight orthotic braces  
LANGLEY-11894 875-10303 05

**ORTHOTROPIC SHELLS**

Computer program for numerical analysis of stiffened shells of revolution  
M-FS-23027 875-10094 09

**OSCILLATORS**

Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument  
LANGLEY-11735 875-10035 03  
One-dimensional multimode and multistate oscillator A concept  
HQ-10851 875-10088 01  
Temperature-stable Gunn-diode oscillator  
M-FS-23242 875-10306 01  
Signal mixer for optical heterodyne receiver  
M-FS-23251 875-10307 03  
Trigger circuit forces immediate synchronization of free-running oscillator  
NPO-13646 875-10337 01

**OSMOSIS**

Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04

**OUTGASSING**

Nongassing NiCd battery cell  
NPO-11853 875-10174 04

**OVERVOLTAGE**

A test and measurement technique for determining possible lightning-induced voltages in aircraft electrical circuits  
LEWIS-12109 875-10068 02  
Response of tantalum capacitors to fast transient overvoltages  
MSC-14822 875-10274 01

**OXIDATION RESISTANCE**

Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 875-10246 04

**OXYACETYLENE**

Method for evaluating effectiveness of dry fire-extinguishing chemicals  
ARC-10869 875-10027 04

**OXYGEN**

Flammability study of materials in oxygen environments  
M-FS-23306 875-10310 04

**OXYGEN BREATHING**

Ultrastructural alteration of mouse lung by prolonged exposure to mixtures of helium and oxygen  
ARC-10929 875-10061 05

**OXYGEN PRODUCTION**

Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04

**OXYGEN SUPPLY EQUIPMENT**

Oxygen cocoon for patients under intensive care  
MSC-12663 875-10079 05

**P****P-N JUNCTIONS**

Improved photovoltaic devices, using transparent contacts  
LANGLEY-11761 875-10220 01

**PARABOLIC ANTENNAS**

Highly-efficient horn/reflector antenna  
NPO-13568 875-10330 01

**PARACHUTES**

Amplifying ribbon extensometer  
LANGLEY-11825 875-10300 06

**PARAMETRIC AMPLIFIERS**

Varactor diode assembly with low parasitic reactances  
GSFC-11617 875-10031 01  
Integrated-circuit balanced parametric amplifier  
M-FS-23193 875-10102 01

**PARTICLE SIZE DISTRIBUTION**

Developments in spectrophotometry II  
A multiple-frequency particle-size spectrometer  
NPO-13606 875-10333 03  
Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index  
NPO-13614 875-10335 03

**PATHOGENS**

Microbial load monitor  
MSC-14062 875-10167 05

**PATTERN RECOGNITION**

Multispectral data analysis LARSYS III  
MSC-14823 875-10235 03  
Table-lookup algorithm for pattern recognition ELLTAB (Elliptical Table)  
MSC-14866 875-10236 03  
Small interactive image processing system (SMIPS)  
GSFC-12079 875-10295 09

**PAYLOADS**

Two-directional active damper  
LANGLEY-11815 875-10259 06

**PCM TELEMETRY**

Delay-lock-loop code-correlation synchronizer  
GSFC-11868 875-10291 02

**PENETRATION**

Powered fire nozzle for fast penetration of structures A concept  
MSC-19528 875-10111 06

**PERFORMANCE TESTS**

Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 875-10148 05  
Characteristics and performance study of mass spectrometer residual gas analyzers  
LEWIS-12393 875-10185 03

**PERMALLOYS (TRADEMARK)**

A 1-1/2-level on-chip-decoding bubble memory chip design  
LANGLEY-11766 875-10222 01

**PERT**

The Langley Research Center NASA/PERT TIME III  
LANGLEY-11887 875-10302 09

**PHASE CONTROL**

Continuous-phase frequency-shift-keyed generator  
LANGLEY-11638 875-10218 02  
Low-noise K(u)-band receiver input system  
NPO-13645 875-10281 02

**PHASE LOCKED SYSTEMS**

Real-time speech analyzer  
NPO-13465 875-10205 02

**PHASE MODULATION**

Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
HQ-10844 875-10087 03

Power spectrum analysis of staggered quadriphase-shift-keyed signals  
MSC-14865 875-10318 09

**PHASE SHIFT KEYING**

Power spectrum analysis of staggered quadriphase-shift-keyed signals  
MSC-14865 875-10318 09

**PHASE TRANSFORMATIONS**

Automated electronic system for measuring thermophysical properties  
LANGLEY-11883 875-10160 03

Computer program for calculating water and steam properties  
LEWIS-12519 875-10187 09

**PHASE VELOCITY**

Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument  
LANGLEY-11735 875-10035 03

**PHONEMES**

Techniques for decoding speech phonemes and sounds A concept  
GSFC-11898 875-10086 02

**PHOSPHORUS POLYMERS**

Curable polyphosphazenes  
M-FS-23134 875-10038 04

**PHOTOCONDUCTIVITY**

Improved photovoltaic devices using transparent contacts  
LANGLEY-11761 875-10220 01

**PHOTOCONDUCTORS**

Laser scanned image sensors using photoconductors with deep traps  
NPO-13131 875-10112 03  
Optical feedback technique extends frequency response of photoconductors  
LANGLEY-11768 875-10223 03

**PHOTOELECTRIC CELLS**

Position sensing materials wound on a reel  
GSFC-11902 875-10249 07

**PHOTOGRAPHIC PROCESSING EQUIPMENT**

Contact-eutectic-lens fabrication technique  
M-FS-23275 875-10308 04

**PHOTOLUMINESCENCE**

Rapid method for determination of antimicrobial susceptibilities pattern of urinary bacteria  
GSFC-12039 875-10253 05

**PHOTOLYSIS**

Chemical-ionization visible and ultraviolet gas lasers A concept  
NPO-13289 875-10115 03

**PHOTOMETERS**

Wide-angle sun sensors  
NPO-13327 875-10202 03  
Inexpensive pocket-size solar energy meter (insolometer)  
LEWIS-12598 875-10283 01

**PHOTOMULTIPLIER TUBES**

Low-cost compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 875-10152 02  
Continuous detection of viable micro-organisms by chemiluminescence  
MSC-10170 875-10170 05

Electro-optical detector to improve sensitivity of a focal-plane mass spectrometer  
NPO-13524 875-10328 03

**PHOTON BEAMS**

Soft X-ray lasers using distributed-feedback reflection A concept  
NPO-13532 875-10239 03

**PHOTORECEPTORS**

Read-only optical storage medium  
M-FS-23169 875-10305 03

**PHOTOSENSITIVITY**

Electro-optical detector to improve sensitivity of a focal-plane mass spectrometer  
NPO-13524 875-10328 03

**PHOTOVOLTAIC CELLS**

Schottky barrier solar cell promises improved efficiency  
NPO-13482 875-10125 03  
Improved photovoltaic devices using transparent contacts  
LANGLEY-11761 875-10220 01

**PHYSIOLOGICAL EFFECTS**

Ultrastructural alteration of mouse lung by prolonged exposure to mixtures of helium and oxygen  
ARC-10929 875-10061 05

**PIEZOELECTRIC TRANSDUCERS**

Ultrasonic detection of flaws in large structural areas  
MSC-19499 875-10201 06

**PIPES (TUBES)**

Low-cost tool set for removing brazed fittings  
NPO-13495 875-10054 07

**PISTON ENGINES**

Simplified heat engine  
NPO-13613 875-10334 07

**PITCH (INCLINATION)**

New design of hingeless helicopter rotor improves stability  
ARC 10807 875-10132 06

**PLANNING**

The Langley Research Center NASA/PERT TIME III  
LANGLEY-11887 875-10302 09

**PLASMA DIAGNOSTICS**

Apparatus for study of plasmas at elevated temperatures  
ARC-10958 875-10285 03

**PLASMA SPRAYING**

Dielectric films improve life of polymeric insulators  
ARC-10892 875-10084 04

**PLASMA TEMPERATURE**

Low-cost, compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 875-10152 02

**PLASTIC PROPERTIES**

RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 875-10186 09

**PLASTICS**

Determination of water content using mass spectrometry  
LANGLEY-11774 875-10157 04  
Flammability study of materials in oxygen environments  
M-FS-23306 875-10310 04

**PLATING**

Induction heating simplifies metal evaporation for ion plating  
LEWIS-12595 875-10288 03

**PLOTTING**

Computer program for analysis of vectorcardiograms (VECTAN II)  
MSC-14386 875-10106 09  
Method of identifying clusters representing statistical dependencies in multivariate data  
ARC-10744 875-10140 09  
General optics evaluation program (GENOPTICS)  
GSFC-12038 875-10294 09

**PLUGS**

Fabrication of porous plugs for control of liquid helium  
M-FS-23218 875-10163 04

**PLUMES**

Handbook for estimating toxic fuel hazards  
M-FS-21114 875-10198 04  
Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 875-10275 02

**PNEUMATICS**

Simplified heat engine  
NPO-13613 875-10334 07

**POLARIZED LIGHT**

Developments in spectrophotometry I  
An instrument for high-resolution measurements of optical intensity and polarization  
NPO-13604 875-10332 03

**POLLUTION**

Investigations of multiple jets in a crossflow  
LEWIS-12102 875-10149 03  
Risk management technique for liquefied natural gas facilities  
KSC-11005 875-10193 04  
Developments in spectrophotometry I  
An instrument for high-resolution measurements of optical intensity and polarization  
NPO-13604 875-10332 03

**POLLUTION CONTROL**

Airfoil disperses smokestack effluents upward  
LANGLEY-11669 875-10074 06

**POLYAMIDE RESINS**

Process for preparing polyimide adhesives  
LANGLEY-11397 875-10257 08

**POLYBENZIMIDAZOLE**

Low-density polybenzimidazole foams for thermal insulation and fire protection  
ARC-10823 875-10056 04

**POLYCRYSTALS**

Low-Cost thin-layer silicon solar cells  
GSFC-12023 875-10293 04

**POLYETHYLENES**

Highly-visible air-sea rescue marker  
MSC-12564 875-10166 05

**POLYIMIDE RESINS**

Fabrication of composite fan blades using PMR A-type polyimide resin and graphite fiber reinforcement  
LEWIS-12366 875-10066 04  
Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 875-10137 04

**POLYIMIDES**

Improved printed-wiring boards for high-reliability circuits  
M-FS-23147 875-10039 01  
Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06

- Lightweight ducts fabricated from reinforced plastics and elastomers  
MSC-19482 B75-10173 06
- POLYMER CHEMISTRY**  
Curable polyphosphazenes  
M-FS-23134 B75-10038 04  
Automated data acquisition and reduction system for torsional braid analyzer  
LANGLEY-11578 B75-10073 02  
Tailor making high performance graphite fiber reinforced PMR polyimides  
LEWIS-12416 B75-10137 04  
Process for preparing polyimide adhesives  
LANGLEY-11397 B75-10257 08  
Diamine curing agents for polyurethanes  
LANGLEY-11829 B75-10261 08  
Improved polyelectrolyte for ion exchange fibers  
NPO-13530 B75-10280 04  
A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04  
Covalent bonding of polycations to small polymeric particles  
NPO-13487 B75-10327 04  
New urea-absorbing polymers for artificial kidney machines  
NPO-13620 B75-10336 04
- POLYMERIC FILMS**  
Film mounting method for thermomechanical analysis  
LANGLEY-11330 B75-10072 04  
Dielectric films improve life of polymeric insulators  
ARC-10892 B75-10084 04
- POLYMERIZATION**  
Curable polyphosphazenes  
M-FS-23134 B75-10038 04  
Improved ion exchange membrane  
NPO-13309 B75-10117 04  
Liquid ethylene-propylene copolymers  
NPO-13555 B75-10207 04  
Improved polyelectrolyte for ion exchange fibers  
NPO-13530 B75-10280 04
- POLYMERS**  
Fabrication of composite fan blades using PMR A-type polyimide resin and graphite fiber reinforcement  
LEWIS-12366 B75-10066 04  
Film mounting method for thermomechanical analysis  
LANGLEY-11330 B75-10072 04
- POLYPROPYLENE**  
Highly-visible air-sea rescue marker  
MSC-12564 B75-10166 05
- POLYSTYRENE**  
A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04
- POLYURETHANE FOAM**  
Fiber-modified polyurethane foam for ballistic protection  
ARC-10714 B75-10062 04  
Cryogenic line insulation made from prefabricated polyurethane shells  
MSC-19523 B75-10110 06
- POLYURETHANE RESINS**  
Diamine curing agents for polyurethanes  
LANGLEY-11829 B75-10261 08
- POROUS MATERIALS**  
Fabrication of porous plugs for control of liquid helium  
M-FS-23218 B75-10163 04
- Reconstituted asbestos matrix for fuel cells  
MSC-12568 B75-10339 04
- POSITION (LOCATION)**  
Time-of-arrival lightning activity location system  
KSC-11006 B75-10297 02
- POSITIONING DEVICES (MACHINERY)**  
Motor-driven rack-positioning device  
ARC-10864 B75-10058 06
- POTENTIAL FLOW**  
Computer programs for calculating potential flow in propulsion system inlets  
LEWIS-12152 B75-10018 09
- POWER LINES**  
Fluorescent color coding of power receptacles  
MSC-19504 B75-10109 01
- POWER PLANTS**  
Large-scale solar thermal collector concepts  
M-FS-23167 B75-10098 03
- POWER SPECTRA**  
Power spectrum analysis of staggered quadruphase-shift-keyed signals  
MSC-14865 B75-10318 09
- POWER SUPPLIES**  
100-ampere-hour NiCd battery system  
MSC-14774 B75-10233 01
- POWER SUPPLY CIRCUITS**  
Voltage monitoring system  
KSC-10736 B75-10154 02  
High-voltage stepping supply with fast settling time  
GSFC-11844 B75-10191 02
- PREDICTIONS**  
Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 B75-10138 03  
Time-of-arrival lightning activity location system  
KSC-11006 B75-10297 02
- PRESERVING**  
Control of nonenzymatic browning in intermediate-moisture foods  
MSC-14835 B75-10317 05
- PRESSURE MEASUREMENTS**  
Sound separation probe  
LEWIS-12507 B75-10286 03
- PRESSURE RECORDERS**  
Sound separation probe  
LEWIS-12507 B75-10286 03
- PRESSURE SENSORS**  
Trielectrode capacitive pressure transducer  
ARC-10711 B75-10025 01  
Mounting technique for pressure transducers minimizes measurement interferences  
ARC-10933 B75-10145 08
- PRESSURE VESSELS**  
Variable-volume atomic storage vessel for hydrogen masers  
GSFC-11895 B75-10248 03
- PREVENTION**  
The impact of water on free-falling bodies  
M-FS-23310 B75-10311 03
- PRINTED CIRCUITS**  
Improved printed-wiring boards for high-reliability circuits  
M-FS-23147 B75-10039 01  
Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 B75-10195 01
- Low-loss stripe-line coil for magnetic bubble memory  
LANGLEY-11707 B75-10196 01  
Start/stop switches for testing detonation velocity of explosives  
KSC-10793 B75-10255 01
- PRISMS**  
Holographic direct-vision spectroscopy  
LANGLEY-11750 B75-10090 03  
Visual alignment aid  
LANGLEY-11842 B75-10228 03
- PROBABILITY THEORY**  
Reliability computation from reliability block diagrams  
NPO-13304 B75-10276 07
- PRODUCTION ENGINEERING**  
Reconstituted asbestos matrix for fuel cells  
MSC-12568 B75-10339 04
- PROGRAMMING LANGUAGES**  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 B75-10199 06
- PROJECT MANAGEMENT**  
The Langley Research Center  
NASA/PERT TIME III  
LANGLEY-11887 B75-10302 09
- PROJECTIVE GEOMETRY**  
Trimetric scale for drafting machines  
MSC-15829 B75-10172 09
- PROPELLERS**  
Design procedure for low-drag subsonic airfoils  
LANGLEY-11351 B75-10256 03
- PROPULSION SYSTEM CONFIGURATIONS**  
Computer programs for calculating potential flow in propulsion system inlets  
LEWIS-12152 B75-10018 09
- PROPYLENE**  
Liquid ethylene-propylene copolymers  
NPO-13555 B75-10207 04
- PROSTHETIC DEVICES**  
Mobile automatic metabolic analyzer  
M-FS-23143 B75-10077 05  
Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 B75-10148 05  
Implantable prosthetic pump boosts blood pressure A concept  
NPO-13626 B75-10177 05
- PROTECTIVE CLOTHING**  
Lightweight protective clothing for the safe handling of high-intensity pressurized lamps  
LEWIS-12073 B75-10007 04  
Analytic model for assessing thermal performance of SCUBA divers  
ARC-10927 B75-10029 09
- PROTECTIVE COATINGS**  
Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 B75-10290 04
- PULSE CODE MODULATION**  
Antiresonant ring interferometer for laser cavity dumping mode locking and other applications  
HQ-10844 B75-10087 03
- PULSE COMMUNICATION**  
Fill-in binary loop pulse-torque quantizer  
M-FS-23100 B75-10037 02
- PULSE FREQUENCY MODULATION TELEMETRY**  
Highly stable analog-to-digital converter  
NPO-13385 B75-10277 01



**PULSE WIDTH AMPLITUDE**

**CONVERTERS**  
Laser-to-electricity energy converter for short wavelengths  
NPO-13390 875-10119 03

**PULSED LASERS**  
Compact laser through improved heat conductance  
NPO-13147 875-10176 03

**PULSED RADIATION**  
Computer modeling of arc drivers  
ARC-10955 875-10130 09

**PULSES**  
Techniques for decoding speech phonemes and sounds A concept  
GSFC-11898 875-10086 02

**PUMPS**  
Low-cost portable fire hose tester  
LEWIS-12365 875-10003 06

**PURIFICATION**  
Covalent bonding of polycations to small polymeric particles  
NPO-13487 875-10327 04

**PYROLYSIS**  
Processing for obtaining good quality water from sewage  
NPO-13224 875-10113 04

**Q**

**Q SWITCHED LASERS**  
Compact laser through improved heat conductance  
NPO-13147 875-10176 03

**QUALITY CONTROL**  
Digital tape drive monitor  
GSFC-11925 875-10153 02

Determination of water content using mass spectrometry  
LANGLEY-11774 875-10157 04  
Bubble-domain circuit wafer evaluation coil set  
LANGLEY-11728 875-10197 01

Microcircuit testing and fabrication using scanning electron microscopes  
M-FS-23159 875-10304 01

Quality control of microelectronic wire bonds  
M-FS-23327 875-10312 01

Control of nonenzymatic browning in intermediate-moisture foods  
MSC-14835 875-10317 05

Fast semiautomatic dimensional test set and data logger  
MSC-19554 875-10322 07

**QUANTUM ELECTRODYNAMICS**  
Superconducting quantum-interference devices  
M-FS-23163 875-10097 03

**QUARTZ CRYSTALS**  
Thermoelectrically-cooled quartz microbalance  
M-FS-23101 875-10076 04

Quartz crystal microbalances to measure wind velocity and air humidity  
NPO-13462 875-10124 03

Increasing terminal strip efficiency at cryogenic temperatures  
M-FS-23234 875-10266 03

**QUASARS**  
Quasars as very-accurate clock synchronizers  
NPO-13276 875-10114 02

**R**

**RACKS (GEARS)**  
Motor-driven rack-positioning device  
ARC-10864 875-10058 06

**RADAR BEAMS**  
Highly-efficient horn/reflector antenna  
NPO-13568 875-10330 01

**RADIANT HEATING**  
Electrical gas heater with large flow range capability  
LEWIS-12361 875-10024 03

**RADIATION COUNTERS**  
High-accuracy programable square-law detector system  
NPO-13525 875-10240 02

**RADIATION DETECTORS**  
Microelectronic fabrication of superconducting devices and circuits  
NPO-13419 875-10120 01

**RADIO INTERFEROMETERS**  
Quasars as very-accurate clock synchronizers  
NPO-13276 875-10114 02

**RADIO METEOROLOGY**  
Superconducting quantum-interference devices  
M-FS-23163 875-10097 03

**RADIO SIGNALS**  
Time-of-arrival lightning activity location system  
KSC-11006 875-10297 02

**RADIOACTIVE MATERIALS**  
Risk management technique for liquefied natural gas facilities  
KSC-11005 875-10193 04

**RADIOGRAPHY**  
Determination of bone mineral mass in vivo  
MSC-14276 875-10168 05

**RADIOLOGY**  
Simple computer method provides contours for radiological images  
ARC-10940 875-10146 09

**RAMAN SPECTROSCOPY**  
Angular device for optical filters  
LANGLEY-11796 875-10158 03

**RAREFIED GAS DYNAMICS**  
Heat-operated cryogenic electrical generator  
NPO-13303 875-10116 03

**RAY TRACING**  
General optics evaluation program (GENOPTICS)  
GSFC-12038 875-10294 09

**REACTANCE**  
Varactor diode assembly with low parasitic reactances  
GSFC-11617 875-10031 01

**REACTION TIME**  
Hand tremor and activity sensor  
ARC-10849 875-10057 05

**REACTOR DESIGN**  
Low-cost compact cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 875-10152 02  
Simplified heat engine  
NPO-13613 875-10334 07

**READOUT**  
Position sensing materials wound on a reel  
GSFC-11902 875-10249 07  
Simple temperature sensor with direct readout  
LANGLEY-11818 875-10260 01

**REAL TIME OPERATION**

Interactive graphical computer-aided design system  
M-FS-23157 875-10096 01

Central control element expands computer capability  
M-FS-23216 875-10103 02

Real-time video correlator  
M-FS-23200 875-10265 02

Electrocardiogram signal analyzer  
MSC-12710 875-10269 05

Multichannel high-speed correlator  
NPO-13097 875-10323 02

**RECEIVERS**  
Low-noise K(u)-band receiver input system  
NPO-13645 875-10281 02

Signal mixer for optical heterodyne receiver  
M-FS-23251 875-10307 03

Synchronizer for random binary data  
NPO-13286 875-10325 02

**REDUNDANCY**  
Programed asynchronous serial data interrogation in a two-computer system  
GSFC-11778 875-10184 02

**REDUNDANCY ENCODING**  
Central control element expands computer capability  
M-FS-23216 875-10103 02

**REELS**  
Position sensing materials wound on a reel  
GSFC-11902 875-10249 07

**REFERENCE SYSTEMS**  
Computer system for library access  
GSFC-11952 875-10292 09

**REFINING**  
Reconstituted asbestos matrix for fuel cells  
MSC-12568 875-10339 04

**REFLECTANCE**  
A nondispersive infrared analyzer  
ARC-10631 875-10082 03

**REFLECTED WAVES**  
Soft X-ray lasers using distributed-feedback reflection A concept  
NPO-13532 875-10239 03

**REFLECTORS**  
Highly-efficient horn/reflector antenna  
NPO-13568 875-10330 01

**REFRACTOMETERS**  
Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index  
NPO-13614 875-10335 03

**REFRACTORY MATERIALS**  
Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 875-10138 03

A new high temperature noble metal thermocouple pairing  
LEWIS-12545 875-10245 03

Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 875-10246 04

Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 875-10290 04

Repair of damaged insulation tiles  
MSC-19549 875-10321 04

**REFRIGERATING**

A two-degree Kelvin refrigerator  
NPO-13459 B75-10181 03

**REFRIGERATORS**

Simplified heat engine  
NPO-13613 B75-10334 07

**REGENERATIVE COOLING**

Regenerative cooling design and analysis  
computer program  
LEWIS-12110 B75-10015 09

**REGULATIONS**

Risk management technique for liquefied  
natural gas facilities  
KSC-11005 B75-10193 04

**REINFORCED PLASTICS**

Tailor making high performance graphite  
fiber reinforced PMR polyimides  
LEWIS-12416 B75-10137 04  
Lightweight orthotic braces  
LANGLEY-11894 B75-10303 05

**REINFORCING FIBERS**

Fabrication of composite fan blades using  
PMR A-type polyimide resin and graphite  
fiber reinforcement  
LEWIS-12366 B75-10066 04

**RELIABILITY**

Response of tantalum capacitors to fast  
transient overvoltages  
MSC-14822 B75-10274 01  
Reliability computation from reliability  
block diagrams  
NPO-13304 B75-10276 07

**REMOTE CONSOLES**

Remote file inquiry (RFI) system  
KSC-10837 B75-10155 09

**REMOTE CONTROL**

Solid state remote power controllers for  
120 Vdc power systems  
LEWIS-12523 B75-10150 02

**REMOTE SENSORS**

Remote estimation of soil moisture  
ARC-10867 B75-10026 03  
Data processing large quantities of  
multispectral information  
MSC-14472 B75-10080 03  
Voltage monitoring system  
KSC-10736 B75-10154 02  
Multispectral data analysis LARSYS  
III  
MSC-14823 B75-10235 03  
Table-lookup algorithm for pattern  
recognition ELLTAB (Elliptical Table)  
MSC-14866 B75-10236 03  
Monitor for checking electric-field  
meters  
KSC-10851 B75-10296 02  
Developments in spectrophotometry II  
A multiple-frequency particle-size  
spectrometer  
NPO-13606 B75-10333 03  
Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to  
determine particle-size distribution and  
refractive index  
NPO-13614 B75-10335 03

**REPORTS**

Characteristics and performance study of  
mass spectrometer residual gas analyzers  
LEWIS-12393 B75-10185 03  
Comparative performance of  
twenty-three types of flat plate solar energy  
collectors  
LEWIS-12511 B75-10189 03  
Safety management of a complex R&D  
ground operating system  
LEWIS-12559 B75-10241 07

Industrial laser welding An evaluation  
M-FS-23237 B75-10267 08  
Single crystals of metal solid solutions  
A study  
M-FS-23268 B75-10268 03

A study of accuracy in selected  
numerical-analysis integration techniques  
MSC-14802 B75-10273 09

Response of tantalum capacitors to fast  
transient overvoltages  
MSC-14822 B75-10274 01

Generation of key in cryptographic  
system for secure communications  
NPO-13451 B75-10278 09

Turbine design review text  
LEWIS-12560 B75-10287 06  
The impact of water on free-falling  
bodies  
M-FS-23310 B75-10311 03

A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04

**RESCUE OPERATIONS**

Highly-visible air-sea rescue marker  
MSC-12564 B75-10166 05

**RESIDUAL GAS**

Characteristics and performance study of  
mass spectrometer residual gas analyzers  
LEWIS-12393 B75-10185 03

**RESISTANCE**

A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04

**RESONANT FREQUENCIES**

Variable-volume atomic storage vessel  
for hydrogen masers  
GSFC-11895 B75-10248 03

**RESONATORS**

Resonant chambers for suspending  
materials in air  
NPO-13263 B75-10050 03

**RESPIRATORY PHYSIOLOGY**

Ultrastructural alteration of mouse lung  
by prolonged exposure to mixtures of  
helium and oxygen  
ARC-10929 B75-10061 05

**RESPIRATORY RATE**

Mobile automatic metabolic analyzer  
M-FS-23143 B75-10077 05

**RETARDANTS**

Wide-field birefringent elements  
MSC-12677 B75-10105 03

**RETICLES**

Visual alignment aid  
LANGLEY-11842 B75-10228 03

**RETRACTABLE EQUIPMENT**

Low-profile landing-gear assembly  
ARC-10786 B75-10055 06

**REUSABLE HEAT SHIELDING**

High-temperature reusable surface  
insulation system  
MSC-14688 B75-10042 04

**RIBS (SUPPORTS)**

Biaxial compression test technique  
MSC-14883 B75-10319 08

**RISK**

Risk management technique for liquefied  
natural gas facilities  
KSC-11005 B75-10193 04  
Safety management of a complex R&D  
ground operating system  
LEWIS-12559 B75-10241 07

**RIEVTS**

High-strength rivet does not require  
aging  
MSC-19301 B75-10044 06

**ROCKET ENGINE DESIGN**

Regenerative cooling design and analysis  
computer program  
LEWIS-12110 B75-10015 09  
Design criteria monograph on turbopump  
systems  
LEWIS-12499 B75-10135 06

**ROCKET ENGINES**

Calculation procedure for transient heat  
transfer to a cooled plate in a heated stream  
whose temperature varies arbitrarily with  
time  
LEWIS-12558 B75-10244 03

**ROLLER BEARINGS**

Silicon nitride used as a rolling-element  
bearing material  
LEWIS-12447 B75-10134 06

**ROOFS**

Solar power roof shingle  
LEWIS-12587 B75-10289 01

**ROTARY STABILITY**

Design curves for optimizing stability of  
herringbone-grooved journal bearings  
LEWIS-12442 B75-10063 06

**ROTARY WINGS**

New design of hingeless helicopter rotor  
improves stability  
ARC-10807 B75-10132 06

**ROTOR AERODYNAMICS**

New design of hingeless helicopter rotor  
improves stability  
ARC-10807 B75-10132 06

**S****SAFETY**

Powered fire nozzle for fast penetration  
of structures A concept  
MSC-19528 B75-10111 06

**SAFETY DEVICES**

Lightweight protective clothing for the  
safe handling of high-intensity pressurized  
lamps  
LEWIS-12073 B75-10007 04  
Simple and effective method to lock buoy  
position to ocean currents  
M-FS-23140 B75-10095 06  
Highly-visible air-sea rescue marker  
MSC-12564 B75-10166 05  
Braking action of wheeled vehicles is  
controlled automatically during  
minimum-distance stops  
LANGLEY-11897 B75-10264 06

**SAFETY MANAGEMENT**

Risk management technique for liquefied  
natural gas facilities  
KSC-11005 B75-10193 04  
Safety management of a complex R&D  
ground operating system  
LEWIS-12559 B75-10241 07

**SAILS**

Amplifying ribbon extensometer  
LANGLEY-11825 B75-10300 06

**SAMPLERS**

Automated mass spectrometer/analysis  
system A concept  
NPO-13572 B75-10331 05

**SAPPHIRE**

Increasing terminal strip efficiency at  
cryogenic temperatures  
M-FS-23234 B75-10266 03

**SCALE (RATIO)**

Trimetric scale for drafting machines  
MSC-15829 B75-10172 09

**SCALE MODELS**

Three-dimensional models aid visualization of engineering drawings  
NPO-13394 875-10179 08

**SCANNING**

Laser scanned image sensors using photoconductors with deep traps  
NPO-13131 875-10112 03  
Microcircuit testing and fabrication using scanning electron microscopes  
M-FS-23159 875-10304 01

**SCATTERING**

Chemical-ionization visible and ultraviolet gas lasers A concept  
NPO-13289 875-10115 03

**SEA STATES**

Application of monochromatic ocean wave forecasts to prediction of wave-induced currents  
LANGLEY-11809 875-10226 03

**SEA URCHINS**

Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 875-10282 06

**SEALS (STOPPERS)**

Design criteria monograph on transmission seals  
LEWIS-12403 875-10011 07  
Compressible flow computer program for gas film seals  
LEWIS-12286 875-10020 09  
Regulator for intravenous feeding  
ARC-10758 875-10083 05

**SECURITY**

Video switcher for coupling video cameras to single TV monitor  
KSC-10782 875-10192 02  
Generation of key in cryptographic system for secure communications  
NPO-13451 875-10278 09

**SEDIMENTS**

Miniature sonar fish tag  
LANGLEY-11814 875-10092 02

**SELF ADAPTIVE CONTROL SYSTEMS**

Braking action of wheeled vehicles is controlled automatically during minimum-distance stops  
LANGLEY-11897 875-10264 06

**SELF FOCUSING**

Automatically-focusing microscope system for live tissue observation  
NPO-13215 875-10048 03

**SELF LUBRICATION**

Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06

**SELF OSCILLATION**

High-energy lasers by using distributed reflection A concept  
NPO-13346 875-10118 03  
Laser action generated within a light pipe A concept  
NPO-13531 875-10127 03

**SEMICONDUCTOR DEVICES**

JPL transient radiation analysis by computer program (JTRAC)  
NPO-13470 875-10053 09  
Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 875-10089 08  
High-performance Schottky diodes endure high temperatures  
M-FS-23184 875-10101 01  
Integrated-circuit balanced parametric amplifier  
M-FS-23193 875-10102 01

Laser-to-electricity energy converter for short wavelengths  
NPO-13390 875-10119 03

Schottky barrier solar cell promises improved efficiency

NPO-13482 875-10125 03  
Mounting technique for pressure transducers minimizes measurement interferences

ARC-10933 875-10145 08

**SEMICONDUCTOR LASERS**

Formation of internally-confined semiconductor lasers  
LANGLEY-11770 875-10299 08

**SENSITIVITY**

Rapid method for determination of antimicrobial susceptibilities pattern of urinary bacteria  
GSFC-12039 875-10253 05

**SEQUENTIAL COMPUTERS**

A study of accuracy in selected numerical-analysis integration techniques  
MSC-14802 875-10273 09

**SERVO MECHANISMS**

Torque control system  
GSFC-11077 875-10085 06

**SEWAGE**

Processing for obtaining good quality water from sewage  
NPO-13224 875-10113 04

**SHEAR STRENGTH**

High-strength rivet does not require aging  
MSC-19301 875-10044 06

**SHIFT REGISTERS**

Fourier waveform analyzer  
GSFC-11747 875-10070 01

**SHIPS**

Highly-visible air-sea rescue marker  
MSC-12564 875-10166 05  
Removal of ice and marine growth from ship surfaces A concept  
NPO-13658 875-10282 06

**SHOCK ABSORBERS**

The impact of water on free-falling bodies  
M-FS-23310 875-10311 03

**SHOCK RESISTANCE**

Shock and vibration isolation mount for small electronic components  
NPO-13253 875-10049 01

**SHOCK WAVE GENERATORS**

Computer modeling of arc drivers  
ARC-10955 875-10130 09

**SHORT WAVE RADIATION**

Laser-to-electricity energy converter for short wavelengths  
NPO-13390 875-10119 03

**SIGNAL ANALYSIS**

Fourier waveform analyzer  
GSFC-11747 875-10070 01  
Quasars as very-accurate clock synchronizers  
NPO-13276 875-10114 02  
Sound separation probe  
LEWIS-12507 875-10286 03

**SIGNAL DETECTORS**

New broadband square-law detector  
NPO-13410 875-10180 02  
Synchronizer for random binary data  
NPO-13286 875-10325 02

**SIGNAL ENCODING**

Generation of key in cryptographic system for secure communications  
NPO-13451 875-10278 09

**SIGNAL MIXING**

Signal mixer for optical heterodyne receiver  
M-FS-23251 875-10307 03

**SIGNAL PROCESSING**

Microelectronic fabrication of superconducting devices and circuits  
NPO-13419 875-10120 01  
A hybrid general-purpose bit synchronizer  
MSC-14330 875-10169 02  
New broadband square-law detector  
NPO-13410 875-10180 02  
Electrocardiogram signal analyzer  
MSC-12710 875-10269 05  
Highly stable analog-to-digital converter  
NPO-13385 875-10277 01  
Delay-lock-loop code-correlation synchronizer  
GSFC-11868 875-10291 02  
Time-of-arrival lightning activity location system  
KSC-11006 875-10297 02  
Power spectrum analysis of staggered quadrature-phase-shift-keyed signals  
MSC-14865 875-10318 09  
Multichannel high-speed correlator  
NPO-13097 875-10323 02  
Synchronizer for random binary data  
NPO-13286 875-10325 02

**SIGNAL RECEPTION**

Multibeam-antenna feed system to isolate orthogonally polarized beams  
NPO-13140 875-10046 02

**SIGNAL TO NOISE RATIOS**

Multichannel high-speed correlator  
NPO-13097 875-10323 02

**SILICON**

Low-Cost thin-layer silicon solar cells  
GSFC-12023 875-10293 04

**SILICON DIOXIDE**

Reflecting heat shields made of microstructured fused silica  
ARC-10949 875-10144 04

**SILICON NITRIDES**

Silicon nitride used as a rolling-element bearing material  
LEWIS-12447 875-10134 06

**SILICON RADIATION DETECTORS**

Inexpensive pocket-size solar energy meter (insolometer)  
LEWIS-12598 875-10283 01

**SILICON TRANSISTORS**

Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 875-10089 08

**SILICONE RESINS**

Read-only optical storage medium  
M-FS-23169 875-10305 03

**SILVER ALLOYS**

Single crystals of metal solid solutions A study  
M-FS-23268 875-10268 03

**SILVER CADMIUM BATTERIES**

Heater improves cold-temperature capacity of silver-cadmium batteries  
GSFC-11913 875-10071 01

**SIMULATORS**

High-power ac/dc variable load simulator  
MSC-14788 875-10108 02  
Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 875-10148 05

**SINGLE CRYSTALS**

Increasing terminal strip efficiency at cryogenic temperatures

M-FS-23234 875-10266 03

Single crystals of metal solid solutions

A study

M-FS-23268 875-10268 03

**SIPHONS**

Removal of ice and marine growth from ship surfaces A concept

NPO-13658 875-10282 06

**SIZE DETERMINATION**

Developments in spectrophotometry II

A multiple-frequency particle-size spectrometer

NPO-13606 875-10333 03

Developments in spectrophotometry III

Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index

NPO-13614 875-10335 03

**SKEWNESS**

Digital tape drive monitor

GSFC-11925 875-10153 02

**SKIN (STRUCTURAL MEMBER)**

Biaxial compression test technique

MSC-14883 875-10319 08

**SKYLAB PROGRAM**

Viewfinder/tracking system for Skylab

MSC-14407 875-10040 03

**SLIDING FRICTION**

Scanning-electron-microscope used in real-time study of friction and wear

LEWIS-12448 875-10064 06

**SLIP CASTING**

Reflecting heat shields made of microstructured fused silica

ARC-10949 875-10144 04

**SMOKE ABATEMENT**

Airfoil disperses smokestack effluents upward

LANGLEY-11669 875-10074 06

**SOIL MOISTURE**

Remote estimation of soil moisture

ARC-10867 875-10026 03

**SOLAR CELLS**

Schottky barrier solar cell promises improved efficiency

NPO-13482 875-10125 03

Zener-regulated solar array/battery power system

M-FS-23195 875-10162 02

Improved photovoltaic devices using transparent contacts

LANGLEY-11761 875-10220 01

Solar-cell interconnects

M-FS-23257 875-10231 04

Inexpensive pocket-size solar energy meter (insolometer)

LEWIS-12598 875-10283 01

Solar power roof shingle

LEWIS-12587 875-10289 01

Low-Cost thin-layer silicon solar cells

GSFC-12023 875-10293 04

**SOLAR COLLECTORS**

Survey of coatings for solar collectors

LEWIS-12510 875-10067 04

Large-scale solar thermal collector concepts

M-FS-23167 875-10098 03

Solar residential heating and cooling system

M-FS-23260 875-10165 06

Economical solar-heating or cooling system with new solar-energy concentrators

NPO-13497 875-10182 03

Comparative performance of twenty-three types of flat plate solar energy collectors

LEWIS-12511 875-10189 03

Secondary reflectors for economical sun-tracking energy collection system A concept

NPO-13580 875-10210 03

Automatic solar tracker

NPO-13630 875-10237 03

Low-cost hot-air solar collector

M-FS-23272 875-10301 08

**SOLAR CONSTANT**

Quartz crystal microbalances to measure wind velocity and air humidity

NPO-13462 875-10124 03

**SOLAR ENERGY**

Solar residential heating and cooling system

M-FS-23260 875-10165 06

Economical solar-heating or cooling system with new solar-energy concentrators

NPO-13497 875-10182 03

Inexpensive pocket-size solar energy meter (insolometer)

LEWIS-12598 875-10283 01

**SOLAR GENERATORS**

Comparative performance of twenty-three types of flat plate solar energy collectors

LEWIS-12511 875-10189 03

Solar power roof shingle

LEWIS-12587 875-10289 01

**SOLAR POSITION**

Low-cost solar tracking system

NPO-13579 875-10209 06

**SOLAR RADIATION**

Automatic solar tracker

NPO-13630 875-10237 03

**SOLAR REFLECTORS**

Low-cost solar tracking system

NPO-13579 875-10209 06

Secondary reflectors for economical sun-tracking energy collection system A concept

NPO-13580 875-10210 03

**SOLAR SENSORS**

Large-scale solar thermal collector concepts

M-FS-23167 875-10098 03

Wide-angle sun sensors

NPO-13327 875-10202 03

Low-cost solar tracking system

NPO-13579 875-10209 06

Secondary reflectors for economical sun-tracking energy collection system A concept

NPO-13580 875-10210 03

Automatic solar tracker

NPO-13630 875-10237 03

**SOLENOID VALVES**

Braking action of wheeled vehicles is controlled automatically during minimum-distance stops

LANGLEY-11897 875-10264 06

**SOLID STATE DEVICES**

Sputtered gold mask for deep chemical etching of silicon

LANGLEY-11661 875-10089 08

Solid state remote power controllers for 120 Vdc power systems

LEWIS-12523 875-10150 02

Page composer to translate binary electrical data to optical form

M-FS-22589 875-10161 02

System for simultaneous bidirectional data transmission

MSC-14810 875-10171 01

Improved multiple-target sputtering equipment

NPO-13345 875-10178 04

A two-degree Kelvin refrigerator

NPO-13459 875-10181 03

Response of tantalum capacitors to fast transient overvoltages

MSC-14822 875-10274 01

Formation of internally-confined semiconductor lasers

LANGLEY-11770 875-10299 08

Microcircuit testing and fabrication using scanning electron microscopes

M-FS-23159 875-10304 01

Temperature-stable Gunn-diode oscillator

M-FS-23242 875-10306 01

Solid-state motor control and monitor system

MSC-12721 875-10316 02

**SOLID STATE LASERS**

High-energy lasers by using distributed reflection A concept

NPO-13346 875-10118 03

Tuneable diode laser spectrometer with integral grating

LANGLEY-11830 875-10262 03

**SONAR**

Miniature sonar fish tag

LANGLEY-11814 875-10092 02

**SOUND INTENSITY**

Handbook of noise ratings

LANGLEY-11799 875-10075 03

Portable headset microphone checker

KSC-10699 875-10254 02

**SOUND TRANSMISSION**

Portable headset microphone checker

KSC-10699 875-10254 02

**SOUND WAVES**

Levitation of objects using acoustic energy

M-FS-23261 875-10232 03

Sound separation probe

LEWIS-12507 875-10286 03

**SPACEBORNE TELESCOPES**

Viewfinder/tracking system for Skylab

MSC-14407 875-10040 03

**SPATIAL FILTERING**

Optical-noise suppression unit A concept

MSC-12640 875-10315 03

**SPECTRAL RESOLUTION**

Developments in spectrophotometry I

An instrument for high-resolution measurements of optical intensity and polarization

NPO-13604 875-10332 03

**SPECTROMETERS**

Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument

LANGLEY-11735 875-10035 03

Holographic direct-vision spectroscopy

LANGLEY-11750 875-10090 03

Microcircuit testing and fabrication, using scanning electron microscopes

M-FS-23159 875-10304 01

**SPECTROPHOTOMETRY**

Developments in spectrophotometry I

An instrument for high-resolution measurements of optical intensity and polarization

NPO-13604 875-10332 03

Developments in spectrophotometry II  
A multiple-frequency particle-size spectrometer  
NPO-13606 875-10333 03

Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index  
NPO-13614 875-10335 03

**SPECTROSCOPY**  
Infrared tunable laser A concept  
ARC-10463 875-10081 03

**SPECTRUM ANALYSIS**  
A nondispersive infrared analyzer  
ARC-10631 875-10082 03  
Multispectral data analysis LARSYS III - - -  
MSC-14823 875-10235 03

**SPEECH**  
Techniques for decoding speech phonemes and sounds A concept  
GSFC-11898 875-10086 02  
Real-time speech analyzer  
NPO-13465 875-10205 02

**SPEECH RECOGNITION**  
Techniques for decoding speech phonemes and sounds A concept  
GSFC-11898 875-10086 02  
Real-time speech analyzer  
NPO-13465 875-10205 02

**SPHERICAL TANKS**  
Suspension system for lightweight cryogenic tank  
MSC-14080 875-10270 06

**SPOOLS**  
Position sensing materials wound on a reel  
GSFC-11902 875-10249 07

**SPUTTERING**  
Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 875-10089 08  
Improved multiple-target sputtering equipment  
NPO-13345 875-10178 04

**SQUARE WAVES**  
New broadband square-law detector  
NPO-13410 875-10180 02  
High-accuracy programmable square-law detector system  
NPO-13525 875-10240 02

**STABILITY**  
Single radial magnetic bearing A concept  
GSFC-11978 875-10251 06  
Ultraviolet hydrogen-discharge lamp  
MSC-14793 875-10272 03

**STABILIZATION**  
Torque control system  
GSFC-11077 875-10085 06

**STACKS**  
Airfoil disperses smokestack effluents upward  
LANGLEY-11669 875-10074 06  
Laser-excited fluorescence for measuring atmospheric pollution  
NPO-13231 875-10275 02

**STAINLESS STEELS**  
Industrial laser welding An evaluation  
M-FS-23237 875-10267 08  
Influence of heat treatment on mechanical properties of 300M steel  
MSC-14792 875-10271 04

**STANDARDIZATION**  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 875-10199 06

**STANDING WAVES**  
Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument  
LANGLEY-11735 875-10035 03  
Resonant chambers for suspending materials in air  
NPO-13263 875-10050 03  
One-dimensional multimode and multistate oscillator A concept  
HQ-10851 875-10088 01  
Levitization of objects using acoustic energy  
M-FS-23261 875-10232 03

**STAR TRACKERS**  
Refracting lens system for low-scatter star-tracker A Concept  
MSC-14724 875-10043 03

**STATIC FRICTION**  
Apparatus for measuring static coefficient of friction under compressive loads  
GSFC-11893 875-10214 06

**STATISTICAL ANALYSIS**  
Automated statistical analysis program (ASAP)  
LANGLEY-11125 875-10217 02  
Minimization search method for data inversion  
NPO-99999 875-10338 09

**STEAM**  
Computer program for calculating water and steam properties  
LEWIS-12519 875-10187 09  
Steam automobile analysis  
M-FS-23188 875-10229 03

**STEAM TURBINES**  
Turbine design review text  
LEWIS-12560 875-10287 06

**STEELS**  
Low-Cost thin-layer silicon solar cells  
GSFC-12023 875-10293 04

**STIFFENING**  
Biaxial compression test technique  
MSC-14883 875-10319 08

**STORAGE STABILITY**  
High-power CW laser using hydrogen-fluorine reaction  
NPO-13623 875-10183 03

**STORAGE TANKS**  
Suspension system for lightweight cryogenic tank  
MSC-14080 875-10270 06

**STRAIN GAGES**  
High-temperature capacitive strain measurement system  
FRC-10053 875-10069 01  
Amplifying ribbon extensometer  
LANGLEY-11825 875-10300 06

**STRESS ANALYSIS**  
Program for analysis of nonlinear equilibrium and stability (PANES)  
M-FS-23172 875-10100 09  
Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 875-10138 03  
RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 875-10186 09  
Read-only optical storage medium  
M-FS-23169 875-10305 03

**STRESS CORROSION**  
Aluminum alloys with improved strength  
M-FS-23239 875-10200 04

**STRESS MEASUREMENT**  
High-temperature capacitive strain measurement system  
FRC-10053 875-10069 01

**STRIATION**  
Stripe-line coil for magnetic-field generation in bubble memory devices  
LANGLEY-11705 875-10195 01  
Low-loss stripe-line coil for magnetic bubble memory  
LANGLEY-11707 875-10196 01

**STROUHAL NUMBER**  
Study of fluid flow by charged particles  
ARC-10925 875-10028 03

**STRUCTURAL ANALYSIS**  
Computer program for numerical analysis of stiffened shells of revolution  
M-FS-23027 875-10094 09  
Program for analysis of nonlinear equilibrium and stability (PANES)  
M-FS-23172 875-10100 09  
RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
LEWIS-12388 875-10186 09  
Static aeroelastic program  
LANGLEY-11602 875-10298 06

**STRUCTURAL DESIGN**  
Fracture toughness testing data A technology survey and bibliography  
LEWIS-12503 875-10139 03  
Design procedure for low-drag subsonic airfoils  
LANGLEY-11351 875-10256 03  
Turbine design review text  
LEWIS-12560 875-10287 06

**STRUCTURAL ENGINEERING**  
Ultrasonic detection of flaws in large structural areas  
MSC-19499 875-10201 06  
Process for preparing polyimide adhesives  
LANGLEY-11397 875-10257 08

**STRUCTURAL MEMBERS**  
Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06

**SUBMINIATURIZATION**  
Subminiature transducers for measuring forces and deformation of heart muscle  
NPO-13423 875-10051 05

**SUBSONIC SPEED**  
Design procedure for low-drag subsonic airfoils  
LANGLEY-11351 875-10256 03

**SUBSTRATES**  
Bubble-domain circuit wafer evaluation coil set  
LANGLEY-11728 875-10197 01  
Low-Cost thin-layer silicon solar cells  
GSFC-12023 875-10293 04

**SUMMARIES**  
Superconducting quantum-interference devices  
M-FS-23163 875-10097 03  
Design criteria monograph on turbopump systems  
LEWIS-12499 875-10135 06  
Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 875-10138 03  
Fracture toughness testing data A technology survey and bibliography  
LEWIS-12503 875-10139 03

**SUPERCONDUCTING MAGNETS**

Low-noise K(u)-band receiver input system  
NPO-13645 875-10281 02

**SUPERCONDUCTORS**

Superconducting quantum-interference devices  
M-FS-23163 875-10097 03  
Microelectronic fabrication of superconducting devices and circuits  
NPO-13419 875-10120 01  
A two-degree Kelvin refrigerator  
NPO-13459 875-10181 03

**SUPERFLUIDITY**

High-energy lasers by using distributed reflection A concept  
NPO-13346 875-10118 03

**SUPERHEATING**

Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04

**SUPERHIGH FREQUENCIES**

Dual-band ridged waveguide  
LANGLEY-11781 875-10091 01

**SUPERSONIC FLOW**

Laser velocimeter measurements of high-speed compressible flows  
ARC-10781 875-10141 03

**SUPERSONIC TRANSPORTS**

Low-profile landing-gear assembly  
ARC-10786 875-10055 06

**SUPERSONIC TURBINES**

Turbine design review text  
LEWIS-12560 875-10287 06

**SURFACE CRACKS**

In-service turbine wheel crack monitor  
LEWIS-12422 875-10012 02

**SURGES**

A test and measurement technique for determining possible lightning-induced voltages in aircraft electrical circuits  
LEWIS-12109 875-10068 02

**SUSPENDING (HANGING)**

Resonant chambers for suspending materials in air  
NPO-13263 875-10050 03  
Suspension system for lightweight cryogenic tank  
MSC-14080 875-10270 06

**SWITCHES**

Start/stop switches for testing detonation velocity of explosives  
KSC-10793 875-10255 01

**SWITCHING**

Video switcher for coupling video cameras to single TV monitor  
KSC-10782 875-10192 02

**SWITCHING CIRCUITS**

Transmitter switch for high-power microwave output  
NPO-13439 875-10122 02  
Solid state remote power controllers for 120 Vdc power systems  
LEWIS-12523 875-10150 02  
A 1-1/2-level on-chip-decoding bubble memory chip design  
LANGLEY-11766 875-10222 01  
Three-phase dc motor decoder  
GSFC-11824 875-10247 02  
Solid-state motor control and monitor system  
MSC-12721 875-10316 02

**SWITCHING THEORY**

Central control element expands computer capability  
M-FS-23216 875-10103 02

**SYNCHRONISM**

Quasars as very-accurate clock synchronizers  
NPO-13276 875-10114 02  
Synchronizer for random binary data  
NPO-13286 875-10325 02  
Computer/computer interface  
NPO-13428 875-10326 02

**SYNCHRONIZERS**

Delay-lock-loop code-correlation synchronizer  
GSFC-11868 875-10291 02  
Trigger circuit forces immediate synchronization of free-running oscillator  
NPO-13646 875-10337 01

**T****TABLES (DATA)**

Table-lookup algorithm for pattern recognition ELLTAB (Elliptical Table)  
MSC-14866 875-10236 03

**TANKS (CONTAINERS)**

Foam-machining tool with eddy-current transducer  
M-FS-23298 875-10309 08

**TANTALUM**

Response of tantalum capacitors to fast transient overvoltages  
MSC-14822 875-10274 01

**TANTALUM ALLOYS**

High strength forgeable tantalum base alloy  
LEWIS-11386 875-10023 04

**TAYLOR SERIES**

Electrocardiogram signal analyzer  
MSC-12710 875-10269 05

**TELECOMMUNICATION**

Transmission line for S-band masers  
NPO-13504 875-10126 03  
Multiplexing technique for computer communications via satellite channels  
ARC-10879 875-10133 09  
New broadband square-law detector  
NPO-13410 875-10180 02

**TELESCOPES**

Torque control system  
GSFC-11077 875-10085 06  
Visual alignment aid  
LANGLEY-11842 875-10228 03  
Highly stable analog-to-digital converter  
NPO-13385 875-10277 01  
General optics evaluation program (GENOPTICS)  
GSFC-12038 875-10294 09

**TELEVISION SYSTEMS**

Video switcher for coupling video cameras to single TV monitor  
KSC-10782 875-10192 02

**TEMPERATURE EFFECTS**

Method of attaching insulation tiles  
MSC-12619 875-10104 04  
Double-discharge copper-vapor laser  
NPO-13348 875-10123 03  
Delay-lock-loop code-correlation synchronizer  
GSFC-11868 875-10291 02  
Temperature-stable Gunn-diode oscillator  
M-FS-23242 875-10306 01  
Compound heat pipe operates over broad temperature range  
M-FS-23329 875-10313 06

**TEMPERATURE MEASUREMENT**

Automated electronic system for measuring thermophysical properties  
LANGLEY-11883 875-10160 03  
Simple temperature sensor with direct readout  
LANGLEY-11818 875-10260 01

**TEMPERATURE MEASURING INSTRUMENTS**

Quartz crystal microbalances to measure wind velocity and air humidity  
NPO-13462 875-10124 03

**TEMPERING**

Influence of heat treatment on mechanical properties of 300M steel  
MSC-14792 875-10271 04

**TENSILE PROPERTIES**

Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 875-10246 04

**TENSILE STRENGTH**

Influence of heat treatment on mechanical properties of 300M steel  
MSC-14792 875-10271 04

**TEST CHAMBERS**

Apparatus for study of plasmas at elevated temperatures  
ARC-10958 875-10285 03

**TEST EQUIPMENT**

Low-cost portable fire hose tester  
LEWIS-12365 875-10003 06

**TEST FACILITIES**

Two-directional active damper  
LANGLEY-11815 875-10259 06

**THERMAL ABSORPTION**

Solar residential heating and cooling system  
M-FS-23260 875-10165 06

**THERMAL CONDUCTIVITY**

Fabrication of porous plugs for control of liquid helium  
M-FS-23218 875-10163 04

**THERMAL CONTROL COATINGS**

High-temperature reusable surface insulation system  
MSC-14688 875-10042 04

**THERMAL DISSOCIATION**

High-power CW laser using hydrogen-fluorine reaction  
NPO-13623 875-10183 03  
Using permeable membranes to produce hydrogen and oxygen from water  
MSC-12600 875-10314 04

**THERMAL ENERGY**

Large-scale solar thermal collector concepts  
M-FS-23167 875-10098 03

**THERMAL EXPANSION**

High-temperature capacitive strain measurement system  
FRC-10053 875-10069 01

**THERMAL FATIGUE**

Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
LEWIS-12502 875-10138 03

**THERMAL INSULATION**

Low-density polybenzimidazole foams for thermal insulation and fire protection  
ARC-10823 875-10056 04  
Method of attaching insulation tiles  
MSC-12619 875-10104 04  
Cryogenic line insulation made from prefabricated polyurethane shells  
MSC-19523 875-10110 06

- Transmission line for S-band masers  
NPO-13504 B75-10126 03
- Ceramic thermal protective coating  
withstands hostile environment of rotating  
turbine blades  
LEWIS-12554 B75-10290 04
- Repair of damaged insulation tiles  
MSC-19549 B75-10321 04
- Fast semiautomatic dimensional test set  
and data logger  
MSC-19554 B75-10322 07
- THERMAL PROTECTION**  
Analytic model for assessing thermal  
performance of SCUBA divers  
ARC-10927 B75-10029 09
- THERMAL STABILITY**  
Temperature-stable Gunn-diode  
oscillator  
M-FS-23242 B75-10306 01
- Compound heat pipe operates over broad  
temperature range  
M-FS-23329 B75-10313 06
- THERMAL STRESSES**  
Computer program for numerical analysis  
of stiffened shells of revolution  
M-FS-23027 B75-10094 09
- RETSCP-A computer program for  
analysis of rocket engine thermal strains  
with cyclic plasticity  
LEWIS-12388 B75-10186 09
- THERMOCHEMICAL PROPERTIES**  
Double-discharge copper-vapor laser  
NPO-13348 B75-10123 03
- Laser using lead chloride vapor  
NPO-13615 B75-10128 03
- THERMOCOUPLES**  
A new high temperature noble metal  
thermocouple pairing  
LEWIS-12545 B75-10245 03
- THERMODYNAMIC EFFICIENCY**  
Computer program for thermodynamic  
analysis of open-cycle multishaft power  
system  
LEWIS-12324 B75-10002 09
- THERMODYNAMIC PROPERTIES**  
Properties of air and combustion products  
of fuel with air  
LEWIS-12402 B75-10004 03
- Film mounting method for  
thermomechanical analysis  
LANGLEY-11330 B75-10072 04
- Computer program for calculating water  
and steam properties  
LEWIS-12519 B75-10187 09
- Computer program for calculating  
thermodynamic and transport properties of  
fluids  
LEWIS-12520 B75-10188 09
- THERMODYNAMICS**  
Using permeable membranes to produce  
hydrogen and oxygen from water  
MSC-12600 B75-10314 04
- THERMOELECTRIC COOLING**  
Thermoelectrically-cooled quartz  
microbalance  
M-FS-23101 B75-10076 04
- THERMOPHYSICAL PROPERTIES**  
Automated electronic system for  
measuring thermophysical properties  
LANGLEY-11883 B75-10160 03
- THERMOREGULATION**  
Analytic model for assessing thermal  
performance of SCUBA divers  
ARC-10927 B75-10029 09
- THICK FILMS**  
Low-loss stripe-line coil for magnetic  
bubble memory  
LANGLEY-11707 B75-10196 01
- THIN FILMS**  
A superior process for forming titanium  
hydrogen isotopic films  
LEWIS-12083 B75-10001 03
- Thin KAPTON polyimide films vacuum  
formed at high temperature retain their  
shape at temperatures to 450 K (350 F)  
LEWIS-12412 B75-10016 04
- High-performance Schottky diodes  
endure high temperatures  
M-FS-23184 B75-10101 01
- Laser-to-electricity energy converter for  
short wavelengths  
NPO-13390 B75-10119 03
- Microelectronic fabrication of  
superconducting devices and circuits  
NPO-13419 B75-10120 01
- Improved multiple-target sputtering  
equipment  
NPO-13345 B75-10178 04
- Measurement of trap density in dielectric  
film  
NPO-13443 B75-10204 02
- Improved chemical vapor-deposition  
reactor  
NPO-13650 B75-10212 08
- Ellipsometer measurements of epitaxial  
GaAs layers A concept  
M-FS-23238 B75-10230 01
- Read-only optical storage medium  
M-FS-23169 B75-10305 03
- THIN WALLED SHELLS**  
Computer program for numerical analysis  
of stiffened shells of revolution  
M-FS-23027 B75-10094 09
- THRUST BEARINGS**  
Long life high speed thrust-load ball  
bearings  
LEWIS-12269 B75-10022 06
- THRUST CHAMBERS**  
Regenerative cooling design and analysis  
computer program  
LEWIS-12110 B75-10015 09
- THRUST CONTROL**  
Improved aircraft reaction nozzles  
ARC-10906 B75-10284 06
- TILES**  
Method of attaching insulation tiles  
MSC-12619 B75-10104 04
- Repair of damaged insulation tiles  
MSC-19549 B75-10321 04
- Fast semiautomatic dimensional test set  
and data logger  
MSC-19554 B75-10322 07
- TIME DIVISION MULTIPLEXING**  
Multiplexing technique for computer  
communications via satellite channels  
ARC-10879 B75-10133 09
- TIME LAG**  
Double-discharge copper-vapor laser  
NPO-13348 B75-10123 03
- New design of hingeless helicopter rotor  
improves stability  
ARC-10807 B75-10132 06
- TIME MEASUREMENT**  
Quasars as very-accurate clock  
synchronizers  
NPO-13276 B75-10114 02
- TIME RESPONSE**  
JPL transient radiation analysis by  
computer program (JTRAC)  
NPO-13470 B75-10053 09
- TIMING DEVICES**  
Delay-lock-loop code-correlation  
synchronizer  
GSFC-11868 B75-10291 02
- TISSUES (BIOLOGY)**  
Automatically-focusing microscope  
system for live tissue observation  
NPO-13215 B75-10048 03
- TITANIUM COMPOUNDS**  
A superior process for forming titanium  
hydrogen isotopic films  
LEWIS-12083 B75-10001 03
- TOLERANCES (MECHANICS)**  
Fast semiautomatic dimensional test set  
and data logger  
MSC-19554 B75-10322 07
- TORQUE**  
Torque control system  
GSFC-11077 B75-10085 06
- TORQUERS**  
Fill-in binary loop pulse-torque  
quantizer  
M-FS-23100 B75-10037 02
- TORSION**  
Automated data acquisition and  
reduction system for torsional braid  
analyzer  
LANGLEY-11578 B75-10073 02
- TOUGHNESS**  
Diamine curing agents for  
polyurethanes  
LANGLEY-11829 B75-10261 08
- Influence of heat treatment on  
mechanical properties of 300M steel  
MSC-14792 B75-10271 04
- TOWED BODIES**  
Simple and effective method to lock buoy  
position to ocean currents  
M-FS-23140 B75-10095 06
- TOXICITY AND SAFETY HAZARD**  
Handbook for estimating toxic fuel  
hazards  
M-FS-21114 B75-10198 04
- TRACE ELEMENTS**  
Dynamic delta method for trace gas  
analysis  
LANGLEY-11800 B75-10159 04
- TRACKING (POSITION)**  
Miniature sonar fish tag  
LANGLEY-11814 B75-10092 02
- Automatic solar tracker  
NPO-13630 B75-10237 03
- TRACKING RADAR**  
High-efficiency K-band tracking antenna  
feed  
MSC-14717 B75-10107 02
- TRAJECTORY ANALYSIS**  
Marshall vehicle-engineering simulation  
system (MARVES)  
M-FS-21701 B75-10199 06
- TRANSDUCERS**  
Subminiature transducers for measuring  
forces and deformation of heart muscle  
NPO-13423 B75-10051 05
- Foam-machining tool with eddy-current  
transducer  
M-FS-23298 B75-10309 08
- TRANSFORMERS**  
System for simultaneous bidirectional  
data transmission  
MSC-14810 B75-10171 01
- High-voltage stepping supply with fast  
settling time  
GSFC-11844 B75-10191 02

**TRANSIENT HEATING**

Automated electronic system for measuring thermophysical properties  
 LANGLEY-11883 B75-10160 03

**TRANSIENT LOADS**

High-power ac/dc variable load simulator  
 MSC-14788 B75-10108 02

**TRANSISTORS**

Solid state remote power controllers for 120 Vdc power systems  
 LEWIS-12523 B75-10150 02  
 Three-phase dc motor decoder  
 GSFC-11824 B75-10247 02

**TRANSMISSION LINES**

Dual-band ridged waveguide  
 LANGLEY-11781 B75-10091 01  
 Transmission line for S-band masers  
 NPO-13504 B75-10126 03  
 Flammability study of materials in oxygen environments  
 M-FS-23306 B75-10310 04

**TRANSMITTERS**

Transmitter switch for high-power microwave output  
 NPO-13439 B75-10122 02

**TRANSPORT PROPERTIES**

Properties of air and combustion products of fuel with air  
 LEWIS-12402 B75-10004 03  
 Laser velocimeter measurements of high-speed compressible flows  
 ARC-10781 B75-10141 03  
 Computer program for calculating water and steam properties  
 LEWIS-12519 B75-10187 09  
 Computer program for calculating thermodynamic and transport properties of fluids  
 LEWIS-12520 B75-10188 09

**TRANSPORTATION**

Two-directional active damper  
 LANGLEY-11815 B75-10259 06

**TRAPPED PARTICLES**

Laser scanned image sensors using photoconductors with deep traps  
 NPO-13131 B75-10112 03

**TRAVELING WAVE MASERS**

Low-noise K(u)-band receiver input system  
 NPO-13645 B75-10281 02

**TUNERS**

Infrared tunable laser A concept  
 ARC-10463 B75-10081 03

**TUNING**

Tuneable diode laser spectrometer with integral grating  
 LANGLEY-11830 B75-10262 03  
 Reflected-wave maser  
 NPO-13490 B75-10279 03

**TURBINE BLADES**

A method for measuring cooling air flow in base coolant passages of rotating turbine blades  
 LEWIS-12433 B75-10017 03  
 Investigations of multiple jets in a crossflow  
 LEWIS-12102 B75-10149 03  
 Calculation procedure for transient heat transfer to a cooled plate in a heated stream whose temperature varies arbitrarily with time  
 LEWIS-12558 B75-10244 03  
 Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
 LEWIS-12562 B75-10246 04

Design procedure for low-drag subsonic airfoils  
 LANGLEY-11351 B75-10256 03

Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
 LEWIS-12554 B75-10290 04

**TURBINE ENGINES**

Design criteria monograph on axial flow turbines  
 LEWIS-12376 B75-10009 06

**TURBINE PUMPS**

Design criteria monograph on turbopump gears  
 LEWIS-12377 B75-10010 06  
 Design criteria monograph on turbopump systems  
 LEWIS-12499 B75-10135 06

**TURBINE WHEELS**

In-service turbine wheel crack monitor  
 LEWIS-12422 B75-10012 02

**TURBINES**

Computer program for thermodynamic analysis of open-cycle multishaft power system  
 LEWIS-12324 B75-10002 09  
 Turbine design review text  
 LEWIS-12560 B75-10287 06

**TURBOCOMPRESSORS**

Computer program for definition of transonic axial-flow compressor blade rows  
 LEWIS-12325 B75-10021 09

**TURBOFAN ENGINES**

Computer program for the attenuation of high bypass turbofan engine noise  
 LEWIS-12179 B75-10242 09

**TURBOFANS**

Fabrication of composite fan blades using PMR A-type polyimide resin and graphite fiber reinforcement  
 LEWIS-12366 B75-10066 04

**TURBOJET ENGINES**

Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
 LEWIS-12417 B75-10190 06

**TURBOMACHINERY**

Design criteria monograph on turbopump gears  
 LEWIS-12377 B75-10010 06  
 Design criteria monograph on turbopump systems  
 LEWIS-12499 B75-10135 06

**TURBOSHAFTS**

Computer program for thermodynamic analysis of open-cycle multishaft power system  
 LEWIS-12324 B75-10002 09

**TURBULENCE**

Laser velocimeter measurements of high-speed compressible flows  
 ARC-10781 B75-10141 03  
 New aircraft instrument indicates turbulence intensity  
 LANGLEY-11833 B75-10227 03

**TURBULENT FLOW**

Sound separation probe  
 LEWIS-12507 B75-10286 03

**U****ULTRASONIC TESTS**

Isometric scan method for ultrasonic evaluation of composite panels  
 LEWIS-12437 B75-10014 01

**ULTRASONIC WAVE TRANSDUCERS**

Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument  
 LANGLEY-11735 B75-10035 03  
 Ultrasonic detection of flaws in large structural areas  
 MSC-19499 B75-10201 06

**ULTRAVIOLET RADIATION**

Chemical-ionization visible and ultraviolet gas lasers A concept  
 NPO-13289 B75-10115 03

**ULTRAVIOLET SPECTROMETERS**

Ultraviolet hydrogen-discharge lamp  
 MSC-14793 B75-10272 03

**UNDERWATER TESTS**

Analytic model for assessing thermal performance of SCUBA divers  
 ARC-10927 B75-10029 09

**UNIVAC COMPUTERS**

Computer program for numerical analysis of stiffened shells of revolution  
 M-FS-23027 B75-10094 09  
 Handbook for estimating toxic fuel hazards  
 M-FS-21114 B75-10198 04

**UNIVAC 1106 COMPUTER**

Computer program for calculating water and steam properties  
 LEWIS-12519 B75-10187 09  
 Computer program for calculating thermodynamic and transport properties of fluids  
 LEWIS-12520 B75-10188 09  
 Improved axisymmetric potential flow computer program  
 LEWIS-12387 B75-10243 09

**UNIVAC 1108 COMPUTER**

JPL transient radiation analysis by computer program (JTRAC)  
 NPO-13470 B75-10053 09

Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
 M-FS-22838 B75-10093 09

Computer program for analysis of vectorcardiograms (VECTAN II)  
 MSC-14386 B75-10106 09

Table-lookup algorithm for pattern recognition ELLTAB (Elliptical Table)  
 MSC-14866 B75-10236 03

Reliability computation from reliability block diagrams  
 NPO-13304 B75-10276 07

**UREAS**

New urea-absorbing polymers for artificial kidney machines  
 NPO-13620 B75-10336 04

**URINALYSIS**

Automated mass spectrometer/analysis system A concept  
 NPO-13572 B75-10331 05

**UROLOGY**

New urea-absorbing polymers for artificial kidney machines  
 NPO-13620 B75-10336 04



## V

**VACUUM CHAMBERS**

- Gas bearing operates in vacuum  
NPO-13425 B75-10052 06
- Characteristics and performance study of mass spectrometer residual gas analyzers  
LEWIS-12393 B75-10185 03

**VACUUM PUMPS**

- Diffusion pump modification promotes self-cleansing and high efficiency  
LEWIS-12323 B75-10065 06

**VALVES**

- Regulator for intravenous feeding  
ARC-10758 B75-10083 05

**VAPOR DEPOSITION**

- Improved chemical vapor-deposition reactor  
NPO-13650 B75-10212 08

**VARACTOR DIODES**

- Varactor diode assembly with low parasitic reactances  
GSFC-11617 B75-10031 01

**VARIABILITY**

- Method of identifying clusters representing statistical dependencies in multivariate data  
ARC-10744 B75-10140 09

**VARIABLE GEOMETRY STRUCTURES**

- Variable-volume atomic storage vessel for hydrogen masers  
GSFC-11895 B75-10248 03

**VARIANCE (STATISTICS)**

- Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
M-FS-22838 B75-10093 09

**VECTORCARDIOGRAPHY**

- Computer program for analysis of vectorcardiograms (VECTAN II)  
MSC-14386 B75-10106 09

**VELOCITY MEASUREMENT**

- Laser velocimeter measurements of high-speed compressible flows  
ARC-10781 B75-10141 03
- Start/stop switches for testing detonation velocity of explosives  
KSC-10793 B75-10255 01

**VENTING**

- Multiple-compartment venting program  
MSC-19428 B75-10234 06

**VIBRATION ISOLATORS**

- Shock and vibration isolation mount for small electronic components  
NPO-13253 B75-10049 01
- Two-directional active damper  
LANGLEY-11815 B75-10259 06

**VIBRATORY LOADS**

- Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 B75-10151 06

**VIDEO DATA**

- Real-time video correlator  
M-FS-23200 B75-10265 02

**VIDEO EQUIPMENT**

- Automatically-focusing microscope system for live tissue observation  
NPO-13215 B75-10048 03
- Video switcher for coupling video cameras to single TV monitor  
KSC-10782 B75-10192 02

**VIEWING**

- Viewfinder/tracking system for Skylab  
MSC-14407 B75-10040 03

**VISCOUS FLOW**

- Dynamic delta method for trace gas analysis  
LANGLEY-11800 B75-10159 04

**VISUAL AIDS**

- Three-dimensional models aid visualization of engineering drawings  
NPO-13394 B75-10179 08

**VOICE COMMUNICATION**

- Real-time speech analyzer  
NPO-13465 B75-10205 02

**VOLTAGE REGULATORS**

- Zener-regulated solar array/battery power system  
M-FS-23195 B75-10162 02
- Nongassing NiCd battery cell  
NPO-11853 B75-10174 04

**VOLTMETERS**

- Voltage monitoring system  
KSC-10736 B75-10154 02
- Simple temperature sensor with direct readout  
LANGLEY-11818 B75-10260 01

**VOLUME**

- Variable-volume atomic storage vessel for hydrogen masers  
GSFC-11895 B75-10248 03

**VORTICES**

- Study of fluid flow by charged particles  
ARC-10925 B75-10028 03
- Coaxial self-aligning optical scanning system  
LANGLEY-11711 B75-10034 03

## W

**WAFERS**

- Bubble-domain circuit wafer evaluation coil set  
LANGLEY-11728 B75-10197 01

**WALKING**

- Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 B75-10148 05

**WARNING SYSTEMS**

- Time-of-arrival lightning activity location system  
KSC-11006 B75-10297 02

**WASTE DISPOSAL**

- Processing for obtaining good quality water from sewage  
NPO-13224 B75-10113 04

**WATER**

- Computer program for calculating water and steam properties  
LEWIS-12519 B75-10187 09

**WATER LANDING**

- The impact of water on free-falling bodies  
M-FS-23310 B75-10311 03

**WATER POLLUTION**

- Miniature sonar fish tag  
LANGLEY-11814 B75-10092 02

**WATER PRESSURE**

- Low-cost portable fire hose tester  
LEWIS-12365 B75-10003 06

**WATER RECLAMATION**

- Continuous detection of viable micro-organisms by chemiluminescence  
MSC-10170 B75-10170 05

**WATER TREATMENT**

- Processing for obtaining good quality water from sewage  
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An instrument for high-resolution measurements of optical intensity and polarization  
NPO-13604 B75-10332 03  
Developments in spectrophotometry II  
A multiple-frequency particle-size spectrometer  
NPO-13606 B75-10333 03  
Developments in spectrophotometry III  
Multiple-field-of-view spectrometer to determine particle-size distribution and refractive index  
NPO-13614 B75-10335 03  
Minimization search method for data inversion  
NPO-99999 B75-10338 09

## G

- GABRIELSEN, R E**  
Algorithm for nonlinear stationary Navier-Stokes problem  
ARC-10960 B75-10143 09
- GANGE, R A**  
Read-only optical storage medium  
M-FS-23169 B75-10305 03
- GARDNER, R A**  
New broadband square-law detector  
NPO-13410 B75-10180 02  
High-accuracy programmable square-law detector system  
NPO-13525 B75-10240 02
- GEISE, P E**  
Real-time video correlator  
M-FS-23200 B75-10265 02
- GELLES, S H**  
Single crystals of metal solid solutions  
A study  
M-FS-23268 B75-10268 03
- GERBER, A H**  
Curable polyphosphazenes  
M-FS-23134 B75-10038 04
- GERSTLEY, J G**  
Regenerative cooling design and analysis computer program  
LEWIS-12110 B75-10015 09
- GIANDOMENICO, A**  
Low-cost tool set for removing brazed fittings  
NPO-13495 B75-10054 07
- GIBSON, S F**  
Microbial load monitor  
MSC-14062 B75-10167 05
- GIFFIN, C E**  
Electro-optical detector to improve sensitivity of a focal-plane mass spectrometer  
NPO-13524 B75-10328 03

- Automated mass spectrometer/analysis system A concept  
NPO-13572 B75-10331 05
- GILBREATH, W P**  
Apparatus for study of plasmas at elevated temperatures  
ARC-10958 B75-10285 03
- GLASSMAN, A J**  
Computer program for thermodynamic analysis of open-cycle multishaft power system  
LEWIS-12324 B75-10002 09
- GLAWE, G E**  
A new high temperature noble metal thermocouple pairing  
LEWIS-12545 B75-10245 03
- GOETTELMAN, R**  
Remote estimation of soil moisture  
ARC-10867 B75-10026 03
- GOLDEN, D P**  
Computer program for analysis of vectorcardiograms (VECTAN II)  
MSC-14386 B75-10106 09
- GOLDSTEIN, R M**  
Quasars as very-accurate clock synchronizers  
NPO-13276 B75-10114 02
- GREELEY, R**  
Remote estimation of soil moisture  
ARC-10867 B75-10026 03
- GREEN, K A**  
Highly-efficient horn/reflector antenna  
NPO-13568 B75-10330 01
- GRIMES, W E**  
Start/stop switches for testing detonation velocity of explosives  
KSC-10793 B75-10255 01
- GROSS, C**  
Sputtered gold mask for deep chemical etching of silicon  
LANGLEY-11661 B75-10089 08
- GRUNTHANER, F J**  
Soft X-ray lasers using distributed-feedback reflection A concept  
NPO-13532 B75-10239 03  
Collimation of electron and X-ray beams using zeolite crystals  
NPO-13557 B75-10329 03
- GUISINGER, J E**  
Measurement of trap density in dielectric film  
NPO-13443 B75-10204 02

## H

- HAEHNER, C L**  
Apparatus for measuring static coefficient of friction under compressive loads  
GSFC-11893 B75-10214 06
- HAGUE, D S**  
Executive computer program for linking independent computer programs  
ODINEX  
LANGLEY-11324 B75-10194 09
- HAMROCK, B J**  
Design curves for optimizing stability of herringbone-grooved journal bearings  
LEWIS-12442 B75-10063 06
- HANSARD, E T**  
Biaxial compression test technique  
MSC-14883 B75-10319 08
- HARPER, P M**  
Low-profile landing-gear assembly  
ARC-10786 B75-10055 06

- HARRISON, G A**  
Ultrastructural alteration of mouse lung by prolonged exposure to mixtures of helium and oxygen  
ARC-10929 875-10061 05
- HARSCH, W C**  
Machine for fabrication of battery-electrode plaques  
GSFC-12004 875-10216 08
- HARTUNG, W**  
Continuous detection of viable micro-organisms by chemiluminescence  
MSC-10170 875-10170 05
- HASKELL, R E**  
Data processing large quantities of multispectral information  
MSC-14472 875-10080 03
- HAYDEN, T S**  
Design criteria monograph on transmission seals  
LEWIS-12403 875-10011 07
- HELLA, R**  
Industrial laser welding An evaluation  
M-FS-23237 875-10267 08
- HENDRICKS, R C**  
Computer program for calculating water and steam properties  
LEWIS-12519 875-10187 09  
Computer program for calculating thermodynamic and transport properties of fluids  
LEWIS-12520 875-10188 09
- HERNDON, E P**  
Low-cost hot-air solar collector  
M-FS-23272 875-10301 08
- HESS, J L**  
Improved axisymmetric potential flow computer program  
LEWIS-12387 875-10243 09
- HEWES, D E**  
Gust alleviation system to improve ride comfort of light airplanes  
LANGLEY-11771 875-10224 03
- HEYMAN, J S**  
Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument  
LANGLEY-11735 875-10035 03
- HIGA, W H**  
Simplified heat engine  
NPO-13613 875-10334 07
- HO, W W**  
Nondestructive measurement of capillary tube internal diameter  
LANGLEY-11647 875-10156 02
- HODGES, D H**  
New design of hingeless helicopter rotor improves stability  
ARC-10807 875-10132 06
- HOFFLER, G W**  
Computer program for analysis of vectorcardiograms (VECTAN II)  
MSC-14386 875-10106 09
- HOLBY, H G**  
Techniques for decoding speech phonemes and sounds A concept  
GSFC-11898 875-10086 02
- HOLDEMAN, L B**  
Superconducting quantum-interference devices  
M-FS-23163 875-10097 03  
Fabrication of porous plugs for control of liquid helium  
M-FS-23218 875-10163 04  
Increasing terminal strip efficiency at cryogenic temperatures  
M-FS-23234 875-10266 03
- HOLEN, J T**  
Microbial load monitor  
MSC-14062 875-10167 05
- HOLLEY, L D**  
Monitor for checking electric-field meters  
KSC-10851 875-10296 02
- HOLMES, J K**  
Synchronizer for random binary data  
NPO-13286 875-10325 02
- HONG, J P**  
Real-time speech analyzer  
NPO-13465 875-10205 02
- HORNER, J L**  
Optical-noise suppression unit A concept  
MSC-12640 875-10315 03
- HOUSEMAN, J**  
Gas generators produce hydrogen-rich fuel  
NPO-13342 875-10203 06  
Hydrogen-rich gas generators to reduce air pollution and improve gasoline economy  
NPO-13560 875-10208 06
- HOVEL, H J**  
Improved photovoltaic devices using transparent contacts  
LANGLEY-11761 875-10220 01
- HOWELL, B J**  
General optics evaluation program (GENOPTICS)  
GSFC-12038 875-10294 09
- HSU, G C**  
New urea-absorbing polymers for artificial kidney machines  
NPO-13620 875-10336 04
- HUDIS, M**  
Dielectric films improve life of polymeric insulators  
ARC-10892 875-10084 04
- HUGHES, D B**  
Determination of water content using mass spectrometry  
LANGLEY-11774 875-10157 04  
Dynamic delta method for trace gas analysis  
LANGLEY-11800 875-10159 04
- HULTZMAN, W W**  
Characteristics and performance study of mass spectrometer residual gas analyzers  
LEWIS-12393 875-10185 03
- HUMPHREY, M F**  
Processing for obtaining good quality water from sewage  
NPO-13224 875-10113 04  
Liquid ethylene-propylene copolymers  
NPO-13555 875-10207 04
- HUMPHRIES, W R**  
Solar residential heating and cooling system  
M-FS-23260 875-10165 06
- HURD, W J**  
Quasars as very-accurate clock synchronizers  
NPO-13276 875-10114 02  
Synchronizer for random binary data  
NPO-13286 875-10325 02
- HWANG, C**  
Mounting technique for pressure transducers minimizes measurement interferences  
ARC-10933 875-10145 08
- INGE, A T**  
Automated data acquisition and reduction system for torsional braid analyzer  
LANGLEY-11578 875-10073 02
- INGEBO, R D**  
Improved air atomizing splash-groove fuel injector reduces pollutant emissions from turbojet engines  
LEWIS-12417 875-10190 06
- INGHAM, J D**  
Liquid ethylene-propylene copolymers  
NPO-13555 875-10207 04
- INGRAM, M**  
Ionene treatment of surfaces stimulates cell growth  
NPO-13421 875-10121 04
- IRICK, S C**  
Reducing flow requirements of fluid actuators  
LANGLEY-11540 875-10258 06

## J

- JACKSON, C E, JR**  
View factor computer program (VIEW)  
GSFC-11910 875-10032 09
- JACKSON, T P**  
Heater improves cold-temperature capacity of silver-cadmium batteries  
GSFC-11913 875-10071 01
- JACOBSON, T P**  
Graphite fiber-polyimide composite rod end bearings for high-temperature high-load applications  
LEWIS-12514 875-10151 06
- JAHNSEN, V J**  
Improved extraction technique for biological fluids  
NPO-13084 875-10045 05
- JENTNER, T A**  
Low-cost compact, cooled photomultiplier assembly for use in magnetic fields up to 1400 Gauss  
LEWIS-12445 875-10152 02
- JOCKE, R F**  
Low-cost portable fire hose tester  
LEWIS-12365 875-10003 06
- JOHNS, H E**  
Lightweight orthotic braces  
LANGLEY-11894 875-10303 05
- JOHNSON, B L**  
Hip-joint simulator accurately duplicates human walking pattern  
LEWIS-12515 875-10148 05
- JOHNSON, D**  
Four-dimensional worldwide atmospheric models ANYPT and ANYRG  
M-FS-22838 875-10093 09
- JOHNSON, D A**  
Laser velocimeter measurements of high-speed compressible flows  
ARC-10781 875-10141 03
- JOHNSON, W R**  
An experimental 100 kilowatt wind turbine generator  
LEWIS-12509 875-10147 03
- JOHNSTON, N J**  
Automated data acquisition and reduction system for torsional braid analyzer  
LANGLEY-11578 875-10073 02

- JONCAS, K P**  
High-power ac/dc variable load simulator  
MSC-14788 B75-10108 02
- JONES, P W**  
Microbial load monitor  
MSC-14062 B75-10167 05
- JONES, R A**  
Automated electronic system for measuring thermophysical properties  
LANGLEY-11883 B75-10160 03
- JONES, W C, III**  
Table-lookup algorithm for pattern recognition ELLTAB (Elliptical Table)  
MSC-14866 B75-10236 03
- JUDY, P F**  
Determination of bone mineral mass in vivo  
MSC-14276 B75-10168 05
- JUVINALL, G L**  
Nongassing NiCd battery cell  
NPO-11853 B75-10174 04

## K

- KAMMERER, C C**  
Ultrasonic detection of flaws in large structural areas  
MSC-19499 B75-10201 06
- KAREL, S**  
Algorithm for nonlinear stationary Navier-Stokes problem  
ARC-10960 B75-10143 09
- KARLE, D W**  
A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04
- KATZBERG, S J**  
Optical feedback technique extends frequency response of photoconductors  
LANGLEY-11768 B75-10223 03
- KEENUM, W E**  
Marshall vehicle-engineering simulation system (MARVES)  
M-FS-21701 B75-10199 06
- KELLER, C H, JR**  
Design criteria monograph on transmission seals  
LEWIS-12403 B75-10011 07
- KELLER, R A**  
Simple computer method provides contours for radiological images  
ARC-10940 B75-10146 09
- KERR, D E**  
Ultraviolet hydrogen-discharge lamp  
MSC-14793 B75-10272 03
- KEY, C F**  
Flammability study of materials in oxygen environments  
M-FS-23306 B75-10310 04
- KEY, J**  
Computer program for numerical analysis of stiffened shells of revolution  
M-FS-23027 B75-10094 09
- KIM, H B**  
High-performance Schottky diodes endure high temperatures  
M-FS-23184 B75-10101 01
- KIRSCHMAN, R K**  
Microelectronic fabrication of superconducting devices and circuits  
NPO-13419 B75-10120 01
- KLEIN, E**  
Improved ion exchange membrane  
NPO-13309 B75-10117 04

- KLUCHER, T M**  
Inexpensive pocket-size solar energy meter (insolometer)  
LEWIS-12598 B75-10283 01
- KONIGSBERG, E**  
Hand tremor and activity sensor  
ARC-10849 B75-10057 05
- KORS, D L**  
Investigations of multiple jets in a crossflow  
LEWIS-12102 B75-10149 03
- KOURTIDES, D A**  
Low-density polybenzimidazole foams for thermal insulation and fire protection  
ARC-10823 B75-10056 04
- KRAMER, J S**  
Automated electronic system for measuring thermophysical properties  
LANGLEY-11883 B75-10160 03
- KRATZE, R H**  
A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04
- KUPPERMANN, A**  
Automated mass spectrometer/analysis system A concept  
NPO-13572 B75-10331 05
- KUSHIDA, R**  
Gas generators produce hydrogen-rich fuel  
NPO-13342 B75-10203 06

## L

- LABUZA, T P**  
Control of nonenzymatic browning in intermediate-moisture foods  
MSC-14835 B75-10317 05
- LAGER, J R**  
Fabrication and repair of graphite/epoxy laminates  
M-FS-23228 B75-10164 08
- LANDGREBE, D A**  
Multispectral data analysis LARSYS III  
MSC-14823 B75-10235 03
- LANGLEY, W R**  
Portable headset microphone checker  
KSC-10699 B75-10254 02
- LANHAM, R N**  
Mounting technique for pressure transducers minimizes measurement interferences  
ARC-10933 B75-10145 08
- LATT, C R**  
Executive computer program for linking independent computer programs  
ODINEX  
LANGLEY-11324 B75-10194 09
- LAUDENSLAGER, J B**  
Chemical-ionization visible and ultraviolet gas lasers A concept  
NPO-13289 B75-10115 03
- LAVE, E G**  
Quartz crystal microbalances to measure wind velocity and air humidity  
NPO-13462 B75-10124 03
- LEAR, W M**  
A study of accuracy in selected numerical-analysis integration techniques  
MSC-14802 B75-10273 09
- LEBLANC, L P**  
Multiple-compartment venting program  
MSC-19428 B75-10234 06

- LEGER, L J**  
Method of attaching insulation tiles  
MSC-12619 B75-10104 04
- LEMKEY, F D**  
Superior high temperature properties available in directionally solidified nickel-base eutectic alloys  
LEWIS-12562 B75-10246 04
- LENNON, C L**  
Time-of-arrival lightning activity location system  
KSC-11006 B75-10297 02
- LERMA, G**  
Cryogenic line insulation made from prefabricated polyurethane shells  
MSC-19523 B75-10110 06
- LESSMANN, G A**  
Inhibiting Kirkendall void growth in welded bimetallic structures  
LEWIS-11573 B75-10006 08
- LESTER, J**  
Suspension system for lightweight cryogenic tank  
MSC-14080 B75-10270 06
- LEU, R K**  
Transmitter switch for high-power microwave output  
NPO-13439 B75-10122 02
- LEVINSON, S**  
Signal mixer for optical heterodyne receiver  
M-FS-23251 B75-10307 03
- LEWIS, G W**  
Subminiature transducers for measuring forces and deformation of heart muscle  
NPO-13423 B75-10051 05
- LEWIS, G W**  
Catheter-tip force transducer for cardiovascular research  
NPO-13643 B75-10211 05
- LIEBERT, C H**  
A method for measuring cooling air flow in base coolant passages of rotating turbine blades  
LEWIS-12433 B75-10017 03
- LIEBERT, C H**  
Ceramic thermal protective coating withstands hostile environment of rotating turbine blades  
LEWIS-12554 B75-10290 04
- LINDBERG, R A**  
Inhibiting Kirkendall void growth in welded bimetallic structures  
LEWIS-11573 B75-10006 08
- LINNECKE, C**  
Continuous detection of viable micro-organisms by chemiluminescence  
MSC-10170 B75-10170 05
- LOCKE, E**  
Industrial laser welding An evaluation  
M-FS-23237 B75-10267 08
- LOKERSON, D C**  
Techniques for decoding speech phonemes and sounds A concept  
GSFC-11898 B75-10086 02
- LONG, M J**  
Reducing flow requirements of fluid actuators  
LANGLEY-11540 B75-10258 06
- LORY, C B**  
Fill-in binary loop pulse-torque quantizer  
M-FS-23100 B75-10037 02
- LOVE, A W**  
Nondestructive measurement of capillary tube internal diameter  
LANGLEY-11647 B75-10156 02



- Simple temperature sensor with direct readout  
 LANGLEY-11818 875-10260 01
- LOVELADY, R W**  
 Miniature sonar fish tag  
 LANGLEY-11814 875-10092 02
- LUCAS, C H**  
 Highly stable analog-to-digital converter  
 NPO-13385 875-10277 01
- LUNDE, A R**  
 Uniform high irradiance source  
 LEWIS-12360 875-10008 03
- LUNDEREN, P R**  
 Acceleration of the aging process by oxygen  
 ARC-10928 875-10030 05
- LYLE, G C**  
 Method of identifying clusters representing statistical dependencies in multivariate data  
 ARC-10744 875-10140 09

## M

- MAAS, J W**  
 Oxygen cocoon for patients under intensive care  
 MSC-12663 875-10079 05
- MADDEN, R**  
 The impact of water on free-falling bodies  
 M-FS-23310 875-10311 03
- MAKI, D W**  
 Temperature-stable Gunn-diode oscillator  
 M-FS-23242 875-10306 01
- MANDEL, G**  
 Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
 LEWIS-12502 875-10138 03
- Fracture toughness testing data A technology survey and bibliography  
 LEWIS-12503 875-10139 03
- MANSOUR, M N**  
 Automatically-focusing microscope system for live tissue observation  
 NPO-13215 875-10048 03
- MARCUS, B D**  
 Computer integration of hydrodynamics equations for heat pipes  
 GSFC-12009 875-10252 09
- MARSH, H E**  
 New urea-absorbing polymers for artificial kidney machines  
 NPO-13620 875-10336 04
- MASERJIAN, J**  
 Laser scanned image sensors using photoconductors with deep traps  
 NPO-13131 875-10112 03
- Measurement of trap density in dielectric film  
 NPO-13443 875-10204 02
- Improved chemical vapor-deposition reactor  
 NPO-13650 875-10212 08
- MAUER, R A**  
 Safety management of a complex R&D ground operating system  
 LEWIS-12559 875-10241 07
- MAYNE, R C**  
 Shock and vibration isolation mount for small electronic components  
 NPO-13253 875-10049 01

- MCBRYAR, H**  
 Using permeable membranes to produce hydrogen and oxygen from water  
 MSC-12600 875-10314 04
- Reconstituted asbestos matrix for fuel cells  
 MSC-12568 875-10339 04
- MCDONALD, G E**  
 Survey of coatings for solar collectors  
 LEWIS-12510 875-10067 04
- MCDUGAL, A R**  
 Three-dimensional models aid visualization of engineering drawings  
 NPO-13394 875-10179 08
- MCEWEN, G N, JR**  
 Quick-change absorption column  
 ARC-10952 875-10142 03
- MCHATTON, A D**  
 Amplifying ribbon extensometer  
 LANGLEY-11825 875-10300 06
- MCKEE, H B**  
 Compound heat pipe operates over broad temperature range  
 M-FS-23329 875-10313 06
- MCKENNA, R T**  
 Digital tape drive monitor  
 GSFC-11925 875-10153 02
- MCKEOWN, D**  
 Thermoelectrically-cooled quartz microbalance  
 M-FS-23101 875-10076 04
- MCWHORTER, F L**  
 Power spectrum analysis of staggered quadruphase-shift-keyed signals  
 MSC-14865 875-10318 09
- MEISSNER, C W, JR**  
 New aircraft instrument indicates turbulence intensity  
 LANGLEY-11833 875-10227 03
- MELTON, D E**  
 Solar residential heating and cooling system  
 M-FS-23260 875-10165 06
- MENZIES, R T**  
 Laser-excited fluorescence for measuring atmospheric pollution  
 NPO-13231 875-10275 02
- MERCEREAU, J E**  
 Microelectronic fabrication of superconducting devices and circuits  
 NPO-13419 875-10120 01
- MERHEIM, N M**  
 Double-discharge copper-vapor laser  
 NPO-13348 875-10123 03
- MEUNIER, G E**  
 Fast semiautomatic dimensional test set and data logger  
 MSC-19554 875-10322 07
- MILLER, A**  
 Wide-field birefringent elements  
 MSC-12677 875-10105 03
- MILLER, C G**  
 A two-degree Kelvin refrigerator  
 NPO-13459 875-10181 03
- Low-cost solar tracking system  
 NPO-13579 875-10209 06
- Secondary reflectors for economical sun-tracking energy collection system A concept  
 NPO-13580 875-10210 03
- MILLER, J F**  
 Single crystals of metal solid solutions A study  
 M-FS-23268 875-10268 03

- MILLER, J G**  
 Transmission oscillator ultrasonic spectrometer (TOUS) A new research instrument  
 LANGLEY-11735 875-10035 03
- MILLER, R E**  
 Low-cost portable fire hose tester  
 LEWIS-12365 875-10003 06
- MILLER, R W**  
 RETSCP-A computer program for analysis of rocket engine thermal strains with cyclic plasticity  
 LEWIS-12388 875-10186 09
- MILLIGAN, R**  
 Low-density polybenzimidazole foams for thermal insulation and fire protection  
 ARC-10823 875-10056 04
- MIQUEL, J**  
 Acceleration of the aging process by oxygen  
 ARC-10928 875-10030 05
- MOIK, J G**  
 Small interactive image processing system (SMIPS)  
 GSFC-12079 875-10295 09
- MONFORD, L G, JR**  
 Solid-state motor control and monitor system  
 MSC-12721 875-10316 02
- MONTEGANI, F J**  
 Computer programs for handling propulsion system noise data  
 LEWIS-12285 875-10019 09
- MONTGOMERY, L D**  
 Analytic model for assessing thermal performance of SCUBA divers  
 ARC-10927 875-10029 09
- MOORE, M T**  
 Sound separation probe  
 LEWIS-12507 875-10286 03
- MOYA, N**  
 Life prediction of materials exposed to monotonic and cyclic loading A technology survey and bibliography  
 LEWIS-12502 875-10138 03
- Fracture toughness testing data A technology survey and bibliography  
 LEWIS-12503 875-10139 03
- MOYNIHAN, P I**  
 High-power CW laser using hydrogen-fluorine reaction  
 NPO-13623 875-10183 03
- MUELLER, W A**  
 New urea-absorbing polymers for artificial kidney machines  
 NPO-13620 875-10336 04
- MUI, D**  
 Repair of damaged insulation tiles  
 MSC-19549 875-10321 04
- MULLER, R M**  
 Position sensing materials wound on a reel  
 GSFC-11902 875-10249 07

## N

- NAGANO, S**  
 Trigger circuit forces immediate synchronization of free-running oscillator  
 NPO-13646 875-10337 01
- NAIMER, J**  
 Highly-visible air-sea rescue marker  
 MSC-12564 875-10166 05

## NEUMANN, F D

Low-profile landing-gear assembly  
ARC-10786 B75-10055 06

## NEWELL, J D

Simple computer method provides  
contours for radiological images  
ARC-10940 B75-10146 09

## NEWMAN, B A

Temperature-stable Gunn-diode  
oscillator  
M-FS-23242 B75-10306 01

## NICOLAS, D P

Microcircuit testing and fabrication using  
scanning electron microscopes  
M-FS-23159 B75-10304 01

## NIES, G E

Thin KAPTON polyimide films vacuum  
formed at high temperature retain their  
shape at temperatures to 450 K (350 F)  
LEWIS-12412 B75-10016 04

## NORGREN, C T

Improved air atomizing splash-groove  
fuel injector reduces pollutant emissions  
from turbojet engines  
LEWIS-12417 B75-10190 06

## NOTARYS, H A

Microelectronic fabrication of  
superconducting devices and circuits  
NPO-13419 B75-10120 01

## O

## OHLSON, J E

Multibeam-antenna feed system to  
isolate orthogonally polarized beams  
NPO-13140 B75-10046 02

## OKINAKA, A K

Buffer control unit for computer  
communications  
ARC-10870 B75-10059 02

## OLESON, C C

Fluorescent color coding of power  
receptacles  
MSC-19504 B75-10109 01

## OLIVE, R S

Sputtered gold mask for deep chemical  
etching of silicon  
LANGLEY-11661 B75-10089 08

## ORMISTON, R A

New design of hingeless helicopter rotor  
improves stability  
ARC-10807 B75-10132 06

## OSHER, J V

Subminiature transducers for measuring  
forces and deformation of heart muscle  
NPO-13423 B75-10051 05

## OVERBAY, L W

Angular device for optical filters  
LANGLEY-11796 B75-10158 03

## P

## PACIOREN, K L

A flame-resistant modified polystyrene  
MSC-14903 B75-10320 04

## PARDOE, C T

Delay-lock-loop code-correlation  
synchronizer  
GSFC-11868 B75-10291 02

## PARKER, J A

Low-density polybenzimidazole foams for  
thermal insulation and fire protection  
ARC-10823 B75-10056 04

Fiber-modified polyurethane foam for  
ballistic protection  
ARC-10714 B75-10062 04

## PARKER, J F

Powered fire nozzle for fast penetration  
of structures A concept  
MSC-19528 B75-10111 06

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